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NATURE MAGAZINE

JUNE. 1927. Vol. IX. No 6.

Rexom

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American Nature Association Activities

So considerable and rapid has been the growth of the membership of the American Nature Association, and consequently, the readers of Nature Magazine, that the Association's offices on beautiful Sixteenth Street have become far too cramped. Since the adjoining lot on the south side of the present building is the property of the Association, it was decided that a substantial addition was essential. Therefore, as this issue goes to press, a duplicate of the present building so far as frontal appearance is concerned is fast growing, brick on brick. It is expected that by September first the American Nature Association and its companion organization, the American Tree Association, will be in quarters adequate to the far-reaching scope of their activities. Members are urged to visit the headquarters when they come to Washington.

* * *

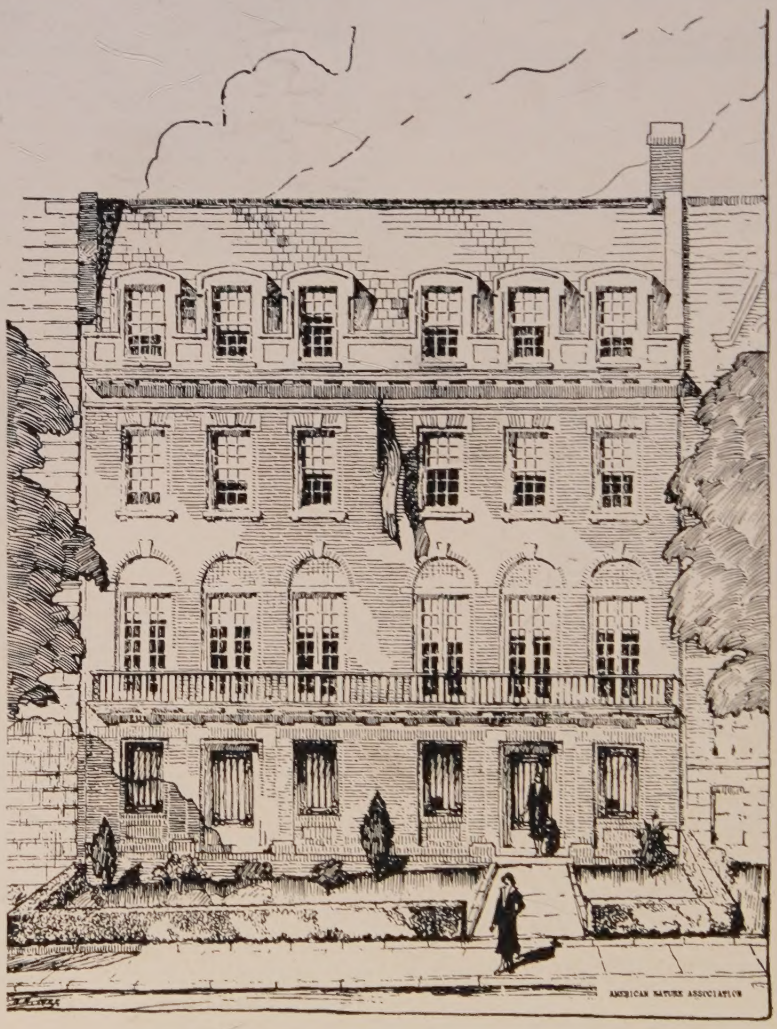
We have had several inquiries as to the source of the remarkably interesting pictures which served to illustrate the article in the May issue entitled "Dinah and the Dinosaur." These pictures were taken by Mrs. Bertha D. Redfield, mother of the author of the article, Mrs. Louise Redfield Peattie, at Hagenbeck's famous zoological park in Hamburg, Germany. The figures are life-size models of prehistoric creatures set about in appropriate and effective settings in the park, creating a great novelty.

* * *

Possibly some of the members of the American Nature Association were tuned in on Station WJZ on Friday, April 29, and heard Olive Hyde Foster broadcasting in behalf of the Association and Nature Magazine. If not, she will be on the air at 2:30 in the afternoon on Friday, May 27, and Friday, June 24, from the same station. The hour is Daylight Saving Time.

* * *

In connection with the campaign for the restriction of billboards, members will be interested to note the important decision handed down by the court with relation to the zoning ordinance of Pittsburgh, Pennsylvania. By this decision the court sustained the right of the Superintendent of Building Operations to refuse renewal of a permit for a large electric sign in a residential district. The ruling establishes the legal exclusion of signboards from residential districts under the provisions of the zoning ordinance.



NEW HOME OF THE AMERICAN NATURE ASSOCIATION
The address is the same, but the half of the building to the left is the new addition.

* * *

Members will be interested in the field activities of the Association in the near future. In August our President, Mr. Arthur Newton Pack, and our Art Director, Mr. R. Bruce Horsfall, will leave for the Rocky Mountain region where they plan to hunt mountain goats and sheep and other wild life with camera and sketch book, respectively. William L. Finley is going on a special camera hunt for American antelope, making his field of operations include parts of Oregon, Idaho and Wyoming. Tom Gill, Forester of the Charles Lathrop Pack Forestry Trust, is leaving in November for Nicaraugua and other Central and South American countries on an expedition of long duration. These, and other field activities, will result in more fine pictures and interesting articles exclusively for Nature Magazine.

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I received my Inkograph with which I am writing this letter. I have purchased at leas one dozen ink pencils. Yours seems to be the only one that gives perfect satisfaction. I believe you have solved the problem of the perfect writing instrument.
Dr. Richard T. McLaury Dunkirk, Ind.

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Wm. L. Fortney, Placerville, Ia

Your Inkograph is everything you state. It is just wonderful. So send me two more.
Arthur Olcott, Tucker, La.

Gave pen thorough tryout. Enclosed find sample of work I have to perform. Have been using pencil. Never got entire satisfaction. Hard pencil makes original too pale and soft pencil makes poor copy. I am highly pleased. S. M. Cooper, Inquiry Division, P. O., South Bend, Ind.

I found the Inkograph all you represent it to be and I was very well satisfied with it. I made a great mistake when I bought the Inkograph, as I did not take out Loss or Theft Insurance on the pen, for the pen is gone. I am writing this to ask that you send me another Inkograph by return mail, charges C.O.D. I can recommend the Inkograph very highly to anyone who needs a pen which will stand up under very hard usage George B. Moore, Columbia, Fla.

It sure has improved my hand writing—I never took home any medals for penmanship but I can almost read my own writing since I got this pen. M. F. Johnson, Medina, Wis.

I want to thank you for the return of my Inkograph pen, which you repaired for me. I feel rather lost without this pen in my pocket. I prefer it to any pen I ever carried principally because of the ease with which one can write with it, not having to be careful whether you slide the pen to the North, East, South or West, it flows freely in all directions. Wm. B. Brown, New York, N. Y.

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Theodore Priestley, Akron, Ohio.

I bought one of your pens a year ago. You sure build the best pen on the market to my notion. Frank R. Ellsworth, Fargo, N. D.

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ROSCOE A. MARVEL
MANAGER

By Ben Lampman

Editorially we are prejudiced in favor of one Ben Hur Lampman, author of many a charming article in the pages of Nature Magazine, but we trust that this enthusiasm does not influence our appreciation of the first book between whose covers are collected some of Mr. Lampman's writings. He is, as one may know, the anonymous editorial writer of that excellent daily, the *Portland Oregonian*. He is also a lover of Nature and one who knows her secrets. He is likewise a philosopher, happy in a deft sense of humor (unhappily lacking in many philosophers), and above all a crafstman in the art of the written word. Into a volume which bears the title *How Could I Be Forgetting?* have been collected many of Mr. Lampman's editorials, briefer writings and occasional verse. It is a charming book to pick up at any time and read, and reread. Howard L. Stroup has contributed numerous attractive illustrations, and Walter W. R. May, Oregonian Building, Portland, Oregon, has done well as the publisher. The price is two dollars.

We almost forgot the dedication, which is delightful. It is: "To Lena, who is very patient with me, but holds that the kitchen is not the place to clean fish."—R. W. W.

Runaway Days

Samuel Scoville, Jr., needs no introduction to the readers of Nature Magazine for they have met his writings within its pages. They will, however, be interested to hear of a new book by this Philadelphia lawyer, whose hobby is Nature and who possesses a facile pen for telling about his hobby. The title he gives to this latest volume is *Runaway Days* and his publishers are Harcourt, Brace and Company, 383 Madison Avenue, New York City. It is a collection of thirteen stories of the wild world and the outdoors, written, of course, in Mr. Scoville's charming style. We are unable to discover a price on the book or wrapper but we suspect that it is two dollars.

Book on Slide Making

Our readers will be interested in a new work on microscope slide technique, designed for beginners of all ages, in this fascinating field of Nature study. It is entitled, "An Introduction to Slide Making," and is published by the New York Biological Supply Company, New York, N. Y., in connection with The Bio-Set. This book, by avoiding technicalities, enables beginners to make their own permanent slides anywhere with the equipment provided in The Bio-Set, and should be of interest to all lovers and students of Nature, particularly to teachers of biology and to parents desirous of stimulating interest in the world of living things surrounding us.

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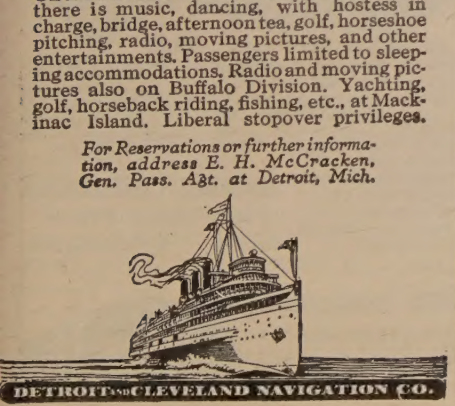

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Beebe's Pheasants

The first edition of William Beebe's monograph of the Pheasants published in four folio volumes was limited to 600 copies. These were so lost among the large university and public libraries that Col. Anthony R. Kuser, to whose generosity the publication was due, decided to bring out another and smaller-sized edition. This has been done in two quarto volumes beautifully illustrated with 31 of the 64 plates in full color, quite equalling those in the first set and most carefully printed. Necessarily many of the finest pictures contained in the first edition have been left out of this second and much less expensive form.

Of the 19 groups nearly one hundred species are included in the text with as much of their life histories as was possible to gain from personal observation and study in the field, combined with facts gathered from first-hand information and former publications.

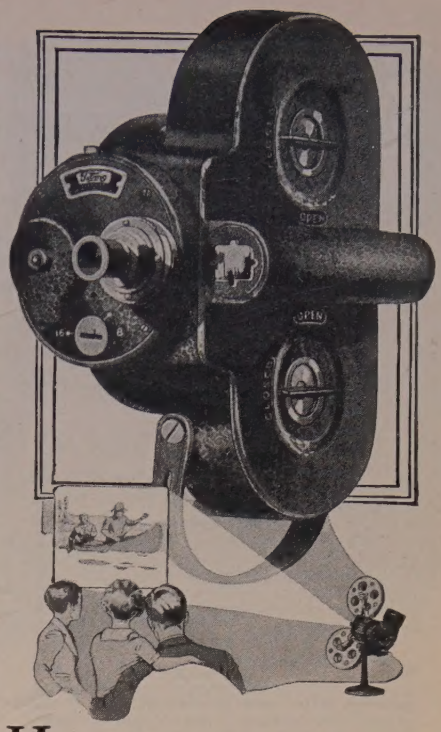
Written by a man of most charming personality and a tremendously fertile imagination, the result is a monumental work of art, a grace to the most complete library—books over which one may spend many pleasant hours and then begin over again with an equal zest.

The writer has seen the first edition but once. However the impression remains that, admirable as these smaller books are, the original volumes should be seen when possible.

Four of the most prominent bird artists made the originals for the 31 color plates. Those by Thorburn easily top the list for beauty and pictorial quality, having some of the characteristic tones of the old masters. Lodge is more virile and, in a measure, more true to life and the out-of-doors effects, with master strokes here and there. Our two foremost American bird painters, Knight and Fuertes, are well represented by excellent examples from their facile brushes; Knight with some lovely schemes of color, light and shade and good composition, while Fuertes has some beautifully spirited conceptions.

Considering that the author touched only the boundaries of a few of the species, the result is a most marvelous achievement. But one is constrained to pause and reflect over the true scientific value of the books. For example: one whole chapter is given over to the ostensibly personal observations of the white-tailed wattled pheasant of Borneo, this chapter then being used to bolster up the theory of protective coloration. At the time of the expedition this species was represented in collections by only eight specimens—four in the Museum at Kuching, two in London and two immature specimens brought to the author by his Dyak hunters. No one but the native Dyaks observed live birds in the wilds for they live miles inland in the inaccessible jungle and far from human inhabitants.

However, setting aside all question of scientific accuracy and considering only the beauty and charm in the word pictures, one must say that they are two wonderfully fine books, worth the price of $15.00 asked by Doubleday, Page & Co. who publish them under the auspices of the New York Zoological Society.—R. B. H.



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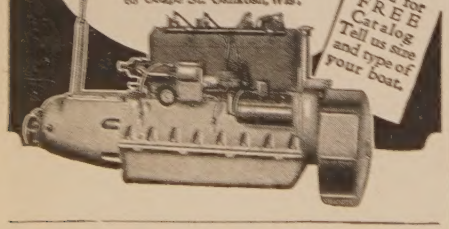

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About the Bluebonnet

Texas has as her State Flower the Bluebonnet, and as a true Texan and lover of flowers, Mrs. Mary Daggett Lake of Fort Worth has published an attractive little pamphlet under the title of *The Legend of the Bluebonnet*. It is an interesting legend. Mrs. Lake prices this booklet at fifty cents and her address is 1415 Grand Avenue, Fort Worth, if you want to learn more about the bluebonnet.

Our Contemporaries

The contents of the January-February issue of *Natural History*, the journal of the American Museum of Natural History, is international in character. It ranges from the leading article entitled, "The Quest for the Dragon of Komodo," by Douglas Burden; through "Northward for Narwhal," by H. C. Raven; to "Glacial Clays Near New York City", by Chester A. Reeds. The first two articles are based upon the East Indian and Greenland Expeditions of the Museum respectively. Other articles include "Samos-Romantic Isle of the Aegean," by Barnum Brown; "The Nest and Nesting Habits of the Butterfish of Gunnell," by E. W. Gudger, and "A Journey in South America," by T. D. A. Cockerell.

Charles W. Michael writes of the nesting of the black swift in Yosemite National Park in the March-April issue of *The Condor*, bi-monthly of the Cooper Ornithological Club. Alexander Wetmore has a helpful article on a method for keeping notes and files dealing with ornithology, and Tracy I. Storer discusses three notable nesting colonies of the cliff swallow in California.

The family secrets of the onion tribe are given out in the April issue of the *American Botanist* by Willard N. Clute in the leading article under the title, "Relatives of the Onion." William Alphonso Murrill writes of "Bladderwort and Spatter Dock," and Fannie M. Heath writes "In Defense of the Mullein."

Tree Army Page
on
Inside Back Cover

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Valuable Plant Report

In achieving the publication of *Plants of Glacier National Park*, Paul C. Standley, Associate Curator, Division of Plants, U. S. National Museum, is more fortunate than many of his fellow workers in the scientific ranks of the Government service. All too frequently important material is forced to wait weary years for publication and then is inadequately treated physically by reason of lack of funds. There comes, however, this important work of Mr. Standley's from the presses of the Government Printing Office and the offices of the Interior Department done in attractive style. It is what the title suggests, but beyond that it is illustrated by five color plates and 150 black and white pictures of the subjects, is printed on good coated paper and includes 110 pages. Mr. Standley is constantly doing valuable work in the botanical field and it is fine to see it given such mounting. The brochure may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for fifty cents and is worth every bit of it to flower lovers.

Black Walnut Needed

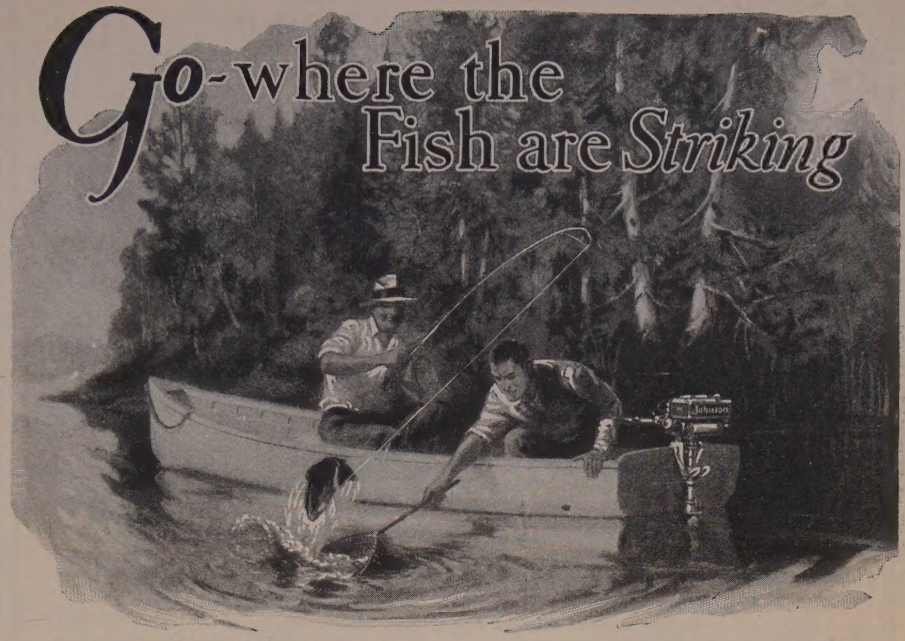
Lucky is the farmer or timberman who has a stand of black walnut trees, for there is a great and increasing demand for these logs suitable for cutting into veneer and making furniture. Farmers' Bulletin No. 1459-F "Selling Black Walnut Timber" will be of value to such people, and may be obtained free of charge from the Forest Service, U. S. Department of Agriculture, Washington, D. C.

On Loblolly Pine

Loblolly pine, sometimes called short leaf pine, one of the South's greatest natural resources, is a good money crop, according to the U. S. Forest Service, which also states that capital is seeking investment in pine-growing lands in the South because they may now be regarded as a safe, long-time investment, with a reasonable assurance of a steady return over an extended period. For the information of landowners in the South who are interested in the growing of loblolly pine as a crop, the Forest Service has issued Farmers' Bulletin 1517-F, "Loblolly Pine Primer," which may be obtained free as long as the supply lasts, on application to the United States Department of Agriculture, Washington, D. C.

Forest Management

A small but extremely useful booklet under this title comes to hand apparently from Robert B. Goodman of Marinette, Wisconsin. It is at once a concentrated study of problems affecting our raw wood supply, various forestry statistics, a summary of state forestry work and private forestry undertakings. Unfortunately there is nothing to indicate the basis upon which interested persons can obtain this booklet from its author.



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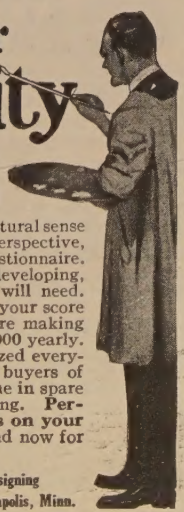

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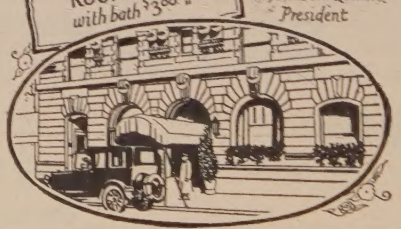

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *Do resurrection plants propagate independently? E. C. H.*

ANSWER: Several widely different plants are called resurrection plants but we assume you refer to Selaginella, a genus of club mosses with many species. These propagate by spores in the same way that ferns do. Most of them are usually multiplied, however, by cuttings planted in light, sandy soil and kept in the shade. If watered very lightly three or four times a day for a week, they generally take root and soon grow to sizable plants.

QUESTION: *Have you any information about the white-face hornet? C. E. B.*

ANSWER: Each colony of white-faced hornets *(Vespa maculata)* is started in the spring by a queen which has survived the winter. She starts a small nest and lays a few eggs and feeds them when they hatch. These are all workers, and after they develop it is their duty to add to the nest and feed the later brood of young, also the late offspring of the old queen. These later broods include queens and males (drones). From time to time queens leave the colony. At the end of the season all the inhabitants of the nest, workers and drones, perish, leaving the perpetuation of the race dependent on the queens.

QUESTION: *There is a large star, early in the evening in the southeast, quite high. I have noticed a smaller star almost joining it—about one diameter from it. What is it? A. M. O.*

ANSWER: The star to which you refer is the planet Jupiter, and the "little star" close to it does not exist but is just an effect of the passage of the planet's light through the earth's atmosphere, a break in the rays that produces the appearance of a small star. It is an effect that will only be noticed in the case of stars or planets of exceptional brightness, such as Sirius, Venus or Jupiter.

QUESTION: *Will you please tell me of the food and care of a baby alligator?—B. B. C.*

ANSWER: Alligators usually wish to hibernate in the winter, and frequently refuse to eat, so it is difficult to tell whether they are well or sick. However, they should be kept in water that is not allowed to get too cold, and deep enough so that they can submerge. They can not swallow their food except under water. Strips of fish are preferred, but meat also is relished.

QUESTION: *I found the caterpillar of a tiger swallow-tailed butterfly. Please tell me where to put it to give it the best chance of living.—M. R. P.*

To mention NATURE MAGAZINE *means to secure prompt attention*

ANSWER: Cocoons should be kept out of doors, where conditions as nearly as possible are similar to those they pick themselves, to have the best chance of survival. Protection with netting will prevent destruction by birds. Freezing is not detrimental, and is even necessary to some species, and the dampness of the out-of-doors is desirable. Keeping them in a warm house will usually cause death from drying.

QUESTION: *I would like to know how the roots of cat-tails are treated for obtaining a substitute for flour, as used by the Germans during the war.—N. U. C.*

ANSWER: We find in German scientific works brief references to the use of flour made from the roots of cat-tails, both as food for human beings and for cattle; there is evidence also that the Indians used the roots to some extent as a food. We find, however, no description of the process, and fear that it is not commercially feasible to produce flour from this plant.

QUESTION: *Please give me information about domestication of the opossum for breeding purposes and how they care for their young.—T. J. McB.*

ANSWER: The domestication of fur-bearers for profit is still in the experimental stage, and has met with little success except in the case of foxes. The breeding of the opossum differs in no essential respect from the same function in other mammals. The young, however, are born in a rather rudimentary condition. After a gestation period of only eleven to sixteen days they are born in the usual way, and then crawl into the mother's pouch and remain there for several weeks.

QUESTION: *Will you please tell me something about air plants? L. H.*

ANSWER: The term air-plant is applied to plants of a great many different groups. Properly speaking, they are those that grow on the bark of trees or other objects, but do not derive any nourishment from their host.

QUESTION: *Please explain the exact meaning of the term "fixed stars." Are they always visible?—J. K. B.*

ANSWER: Fixed stars are those at so vast a distance from the earth that they always occupy the same relative positions in the heavens, disregarding of course the daily revolution of the earth. They are thus contrasted with those stars that change their relative position, for example those that are "evening stars" for a period, and then give place to others.

QUESTION: *Could you give me any information on how to grow pitcher plants under glass?—E. N. S.*

ANSWER: No general instruction can be given as to the culture of pitcher plants other than to say they are lovers of acid soil. In greenhouses they are best grown in pots in muck soil mixed with sand. In a hotbed they should be near the glass, and the pots should stand in water. In their natural summer life they capture and digest insects in their pitcher-like leaves, and probably this is necessary for the best development of the plant.

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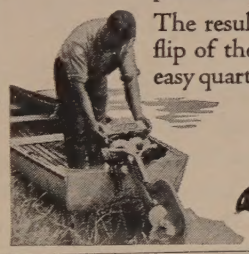

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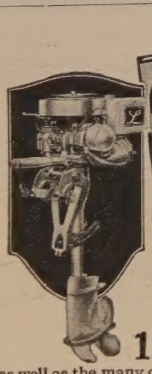

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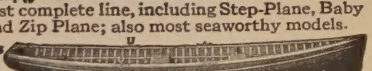

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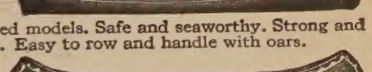

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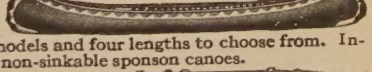

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TABLE OF CONTENTS

June 1927

Nature Calendar		347
Marga, The Gannet	Donald Culross Peattie	349
Tiger Moths and Woolly Bears	A. B. Champlain	353
Cartoon Contest—Prize Awards		354
The Chimney Swifts' Rendezvous	Joel G. Winkjer	356
The Thirst of the Air	Charles Fitzhugh Talman	357
Can Chameleons Think?	George W. Smith	362
Up Stream with the Alewives	Edith M. Patch	363
Jack and Jill, The Vulture Twins	Frank L. Yocom	367
Walking with John Burroughs	William L. Finley	369
Orb-Weavers of the Garden	A. B. Champlain	371
Busy Days with a Dozen Song Birds	Carra E. Horsfall	373
A Miniature Greenhouse	Frances Brinkle Zerbee	377
The California Condor	Doris M. Cochran	378
Interesting Nature for June	E. Laurence Palmer	379
"Big Doings" in the June Skies	Isabel M. Lewis	382
A Nature Puzzle	Florence H. Moore	384
Forests—Anchors of the Hills	Hugh Hammond Bennett	385
Hints and Helps for Home and Garden		389
Nursery Nature Tales		390
Nature Education		391

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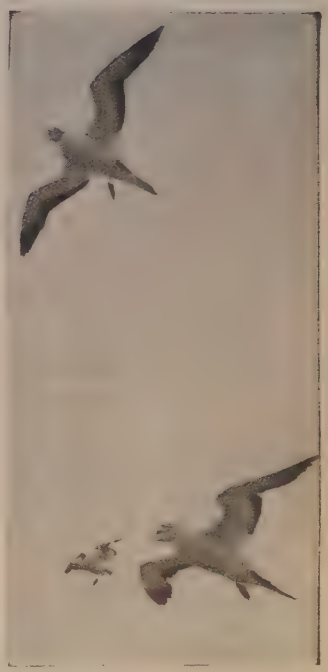
NATURE MAGAZINE

Vol. IX JUNE, 1927 No. 6

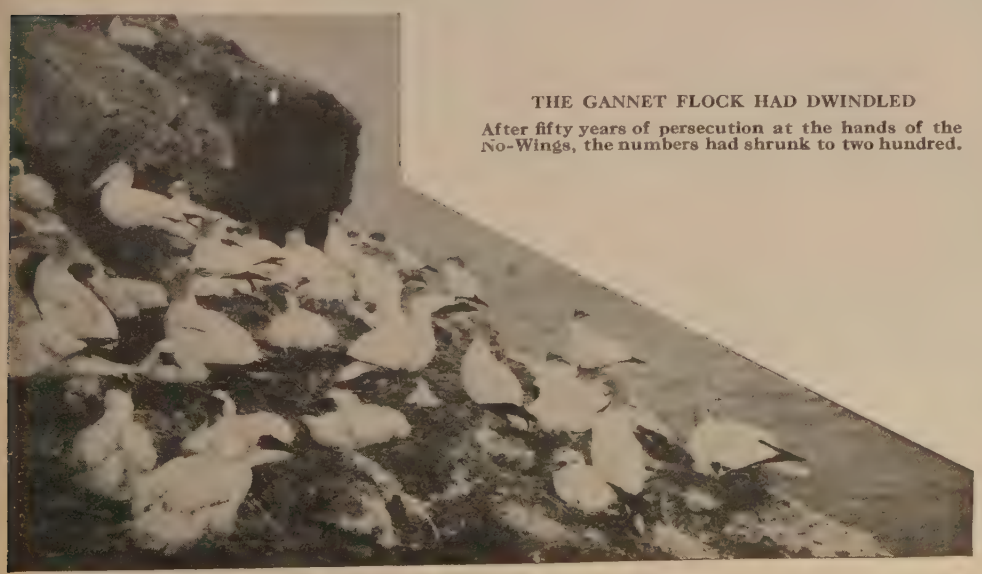
I wonder, do the birds still nest
On Gannet Rock, and court and mate
And dream with head and downy breast?
I wonder, is the spring as late,
As brief and sweet, and does the gale
Still sweep the grass where violets dwell,
Those first sweet blossoms, blue and pale
That azure summer skies foretell?
—*Gannet Rock.*

Marga, the Gannet

by DONALD CULROSS PEATTIE



MARGA was eight days out of her shell when she first opened her eyes and saw the world as it looks from the sea-girt ledges of Gannet Rock, a little promontory of Lundy Island in the Bristol Channel. Marga's mother and father were ridiculously proud of her. They thought her the most beautiful baby gannet on the rock, and there were easily a hundred other babies all about Marga's age. But anybody who looked at Marga without the fond eye of a parent would have thought she was the ugliest little creature in existence, more like a frog than a bird, with only a few pathetic feather-tufts to cover her wrinkled skin which was blotched with sickly browns and blues; her head was still much too large for her body, her wings as useless as a human baby's legs, and her sole accomplishment was opening her mouth enormously and peeping for food until she became so hungry that the peep rose to a howling squawk.



THE GANNET FLOCK HAD DWINDLED

After fifty years of persecution at the hands of the No-Wings, the numbers had shrunk to two hundred.

Just as her parents thought Marga beautiful, so Marga found the world that burst upon her sight very wonderful, indeed. Before she had known only a state of huddling blindness; she could feel the sun warm upon her but could not see it; she grew hungry and was fed; she was cold and her mother came and sat down upon her and warmed her. Now suddenly all was different. Far below her, three hundred feet, the black stone cliff fell away, with the blue wrinkled sea slapping at its side, level as a floor, shimmering as silk,

PHOTO ROLF KEEP

THE NESTING GROUND
A striking view of the New Zealand birds and their home.

PHOTOGRAPH BY ROLF KEEP

NEW ZEALAND GANNET ON ITS NEST
They are like their cousins of the Northern hemisphere except in their wing markings.

lulled in the warmth and peace of mid-July. From little crevices in the cliff, flowers nodded at her, little bright blossoms of thrift and campion, and long grasses that whistled in the light breeze. Marga even liked the smell of fish and seaweed decaying in the sun, and best of all she liked the gentle noises that her plump mother made, waddling about on the ledge beside her, and the cry of her father fishing not far off in the sea—*"Carra! Carrak!"*—a war cry of triumph as he fell like a plummet into the waves. It meant that Marga's dinner was on the way.

And presently dinner came. With a graceful sweep her father alighted on the ledge and stood there poised, his wings still half spread, opening his big kind beak. Marga put her stumpy little bill between her father's long mandibles and pulled out of his mouth and throat the herring that her father had caught and half digested for her baby stomach, and gulped it down in three convulsive motions of her neck and head. Then Marga closed her eyes, and lulled by the crooning of the summer sea and the plaintive, ceaseless *"kittawee! kittawee!"* of the gulls, she fell asleep under the shade of the little tuft of thrift that bloomed and nodded above her nest.

Very much like this were the next days and the next, and before she knew it Marga was covered with a beautiful soft downy coat. By the time she was nine weeks old, the down had vanished and her real feathers had begun to grow, first on her tail, then on wings and body. For a while she was slaty-black, then her head and neck and breast grew white, and bit by bit the white spread down over her wings. In the meantime Marga had plucked up enough courage in her weak and wobbly little legs to paddle about on her webbed feet for a short distance up and down the rock.

Her first experience with the unsympathetic world came while she thus innocently waddled in the sunshine. Suddenly and violently a pecking beak attacked her head and she met the angry face of another youngster, just a little older than she. Marga drew away squawking and got hurriedly back to her nest. The next time she went adventuring she met the same youngster, a young male bully, and this time she did not wait to be attacked but flew upon her enemy and took him by

GANNET LEDGES OF ST. BONAVENTURE
Nesting birds on their island home. These are the northern branch of the interesting family.

PERCÉ ROCK OFF THE GASPÉ COAST
Quebec Province home of some of the gannets that were of Marga's tribe, the Northern branch.

MARGA BECAME DOWNY
Her parents thought that she was very beautiful.

the nape of the neck and shook him till he howled for mercy. She set him down and would have walked on, but the little wretch whom she had chastised wedged himself between her and the wall of the cliff. For a split second it seemed he would succeed in pushing her off the cliff to her death. But Marga got back to safety just in time. After that she went walking in the other direction where her aunt and uncle had their nest and let her paddle about their home and play with Jan, their own nestling. Jan was a male, too, but he did not tease her, and sometimes he came over to Marga's nest and they bit each other's little black beaks.

That was the way Jan and Marga played, and as yet their parents considered them too young to be taught anything or to do anything but play. There were moments, too, when the Awful Feeling hit the pit of Marga's stomach and sometimes made her so sick she vomited up a nice little lunch of anchovies. She saw the old gannets, even her father and mother who were so strong and brave, doing the same thing when the Awful Feeling hit them. Oftenest the Awful Feeling, which was really the only name Marga knew for fear, hit the whole colony of birds at the same moment.

Generally it came in this way: Marga would be blinking in the sun, happy and safe, listening to the soft, frog-like sound of the sentinel bird who continually croaked out a comforting *"grog-grog, grog-grog,"* that said "All's well, all's well." Then suddenly the sentinel would stop and abruptly scream out a terrible *"Bir! Bir!"* that meant "Look out! Danger!"

Instantly Marga's mother (for except at night her father was mostly at sea, fishing) would throw herself upon Marga, covering her head, but not until Marga had seen the terrible white wings of an advancing host of gulls who swept up the cliffs shouting and squealing, hungry as wolves and hoping that somewhere just one mother gannet had been careless and left her fat juicy little baby helpless on the rocks.

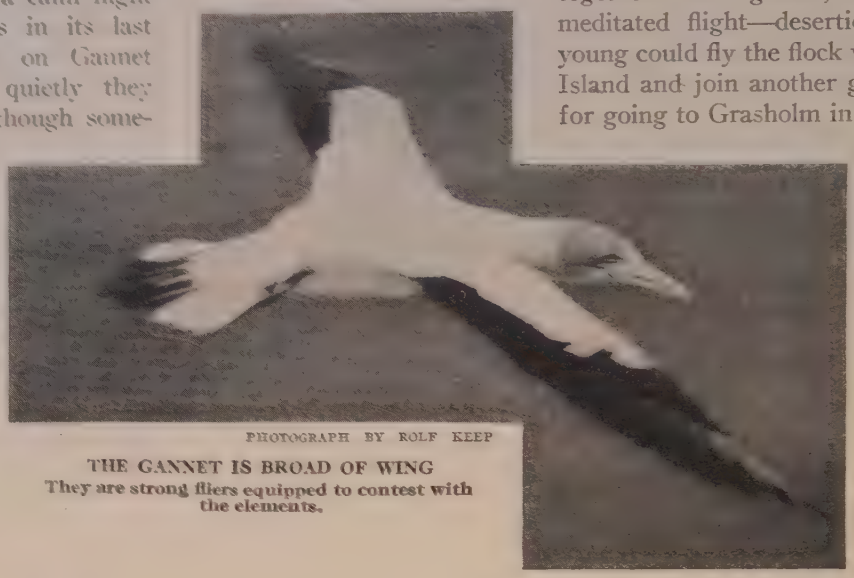
And there was always the dreadful menace of the cliff's edge. Marga's mother had explained all that—how she would fall into the sea and be drowned or seized by a gull, or drop on the rocks and have her head

PHOTOGRABH BY ROLF KEEP

ANOTHER VIEW OF THE NEW ZEALAND ROOKERY
Thousands of gannets nesting on their rocky island home. There is a drop of two hundred feet to the sea.

smashed. It was funny that in spite of this Marga's father said he intended to push her out of the nest if she didn't learn to fly soon.

And one other fear, vaguer but more awful than all the rest, had the whole colony in its grip. It was the fear of the No-wings. Marga had heard about them many times from her mother and father, but she could not imagine any animal, except a fish, that had no wings. All she could learn of the No-wings was that they came across the water on a calm night when the moon was in its last quarter, and landed on Gannet Rock. Then very quietly they stole up the rocks (though sometimes one of them slipped on rotting seaweed and had his brains dashed out on the rocks, a cause for rejoicing among the gannets). Of course there was a sentinel on watch, but of all the birds in the world the gannet finds it hardest to stay awake. The No-wings, the fowlers, crept up on the sentinel and threw a noose around his neck and strangled him before he could raise the cry of *"Bir! Bir!"* that would save his fellows. Or they struck him with a long stick on the head. With the sentinel once dead it was easy for the No-wings to kill every gannet in reach, silently clubbing them. The No-wings came to get juicy young chicks to sell in the city markets, and the feathers of the old birds, the beautiful white plumes, they might save and dispose of for a few pennies. Sometimes they came only for eggs, but they took those in broad daylight, and many were the tales of heroism that Marga heard recounted, of mother birds who had sat their nest defending the egg till knocked over the head.



PHOTOGRAPH BY ROLF KEEP

THE GANNET IS BROAD OF WING
They are strong fliers equipped to contest with the elements.

As autumn came on and it was nearly time for Marga to try that exciting and terrifying plunge from the cliff, the whole colony grew more and more restless and frightened, and if they could, all the gannets would have stayed awake the night through, but not even the Awful Feeling could keep away drowsiness when the sentinel chanted his soft *"grog-grog."* If Marga had ever been to sea and looked back at Gannet Rock she could have seen that only a few ledges were still occupied by the birds. The nests and the chalky white of the guano still lined the cliffs all around the island—many miles of ledges that had once held, some say, ten thousand families of gannets.

In fifty years of persecution by the No-wings that number had fallen to two hundred. It may seem strange that the gannets had not long ago left the scene of their danger. But habit and reverence for the past is stronger in a gannet, who thinks little but acts swiftly and mostly by instinct, than in a Chinese mandarin. Marga's ancestors for three thousand years had lived and died upon Lundy Island, and it was as natural for them to come back from their wide winter roving to this summer breeding place as it was for them to eat fish. To change their home was almost as unthinkable as to change their diet. By the same instinct no gannet ever flies across land if he can help it, or swallows a gurnard except by mistake, or changes its mate unless death robs it of its first-love.

Yet latterly the raids upon Gannet Rock by the No-wings had been so numerous, the little band of birds was so diminished, that the Old Ones had put their heads together for a gabble, and now at last they meditated flight—desertion. As soon as the young could fly the flock would abandon Lundy Island and join another gannetry. Some were for going to Grasholm in Wales, some to Ailsa Rock in the Firth of Clyde. Voices were raised in favor of St. Kilda, The Stack, and The Bass Rock in Scotland, some favored Skellig and The Bull, that rock of roaring waters, in Ireland; there were even stout hearts that talked of the Faroes and Sulisgeir in the North Sea, or the three great gannetries of Iceland. Those were all the places where gannets ever nested, so far as the Old Ones knew, though once a great wind had blown a gannet all the way from Canada, who had told them of bird rocks in the New World.

It was eating humble pie for the ancient inhabitants of Lundy Island to go to any other gannetry and confess themselves defeated. They would have to beg a little perching room, or if they could not get it amicably, they would have to fight for it, and their numbers were already reduced to a pitiful little band. But things had come to a desperate pass. The lighthouses on The Bass Rock and Grasholm were considered too menacing; the gannets on The Bull were fierce and inhospitable; St. Kilda, the greatest gannetry in the world, was so overcrowded there was scarce room for one more webbed foot. So Ailsa Craig was chosen for the new, far home.

But the departure of the gannets from Lundy's Island came sooner than even the grave Elders had imagined. Marga was asleep when it happened. So were her mother and father. Jan was asleep, and his parents were, too. All the colony, naturally hard of hearing, and naturally heavy sleepers, were insensible to the creeping danger on that night in September when the moon was in its last, fateful quarter. Only the sea sobbed its sorrow on the rocks and the sentinel murmured a sleepy *"grog-grog."* Suddenly—

"Bir! Bir!" wailed the gannets, and all the old ones wheeled shrieking out to sea. Clambering to her feet, the Awful Feeling clutching her stomach, Marga staggered forward, reached the edge, and took the awful plunge. Instinctively her wings opened and struggled with a flying motion, but she could not fly; her feathers beat clumsily at air; she fell down, into blackness.

(To be concluded)

PHOTOGRAPH CORNELIA CLARKE

APANTESIS TIGER MOTH AND HER EGGS
One of a large, varied and interesting family noted for its beauty of coloring.

Tiger Moths and Woolly Bears

By A. B. CHAMPLAIN

TIGER moths, so called from the beauty of their variegated coloring and not from any ferocious tendencies, are contrastedly spotted and banded or pure snow white. They have moderately broad wings and stout bodies, and are among our fairly large species of moths. The majority of them fly at night, but occasionally a day-flying species may be found frequenting the open places in the woods. During the daytime, however, most of them are at rest, with their wings sloping roof-like over their bodies, on tree trunks, rocks, walls and similar situations. Belonging to a large family, there are many interesting species of tiger moths scattered over the world. In this country something like one hundred and twenty different kinds are recorded. Some of our common species are the Isabella tiger moth, the harlequin milkweed tiger, the salt marsh tiger, the hickory tiger, and in the accompanying illustrations, the apantesis of which there are a number of species known, and the vestal tiger moth of the West.

PHOTOGRAPH BY CORNELIA CLARKE

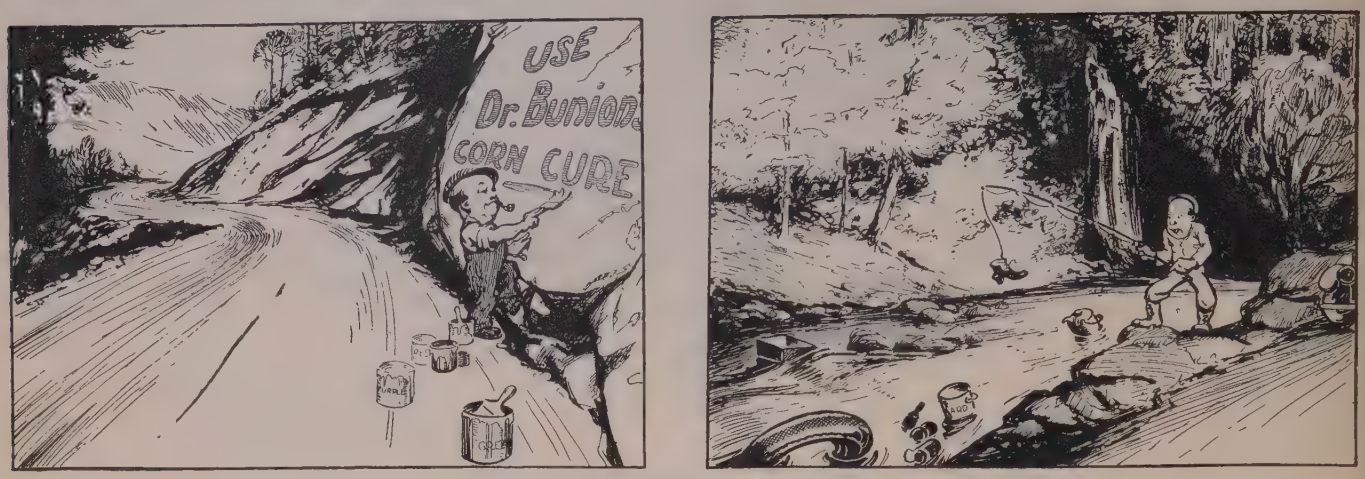
THE VESTAL TIGER MOTH OF THE WEST
Male and female of this moth, the only North American representative of a large species.

From the eggs laid by a female tiger moth, there will hatch the larvae or caterpillars that represent the infant stage of these insects. "Woolly bear" is the popular name by which the caterpillars of many of our common tiger moths are known. The name was given to them in consequence of the coating of long bristle-like hairs with which the bodies of most of them are covered. I may here remark that when alarmed, or the moment we touch one of these "woolly bears" it curls itself up into a ring and falls to the ground. So elastic are the hairs that the caterpillar may be dropped from a considerable height without suffering any injury. It is also likely that its hairy body serves to deter enemies from meddling with it.

The caterpillars or larvae of tiger moths are very general feeders, preferring herbaceous plants, although some species are destructive to the foliage of trees. After becoming full fed some species spend the winter in cocoons woven of silk, mixed with hairs which are shed during the process of pupation. Others continue to feed until the plants are nipped by frost, when they crawl into some convenient place of concealment and sleep away the winter months. With the arrival of April and a new supply of herbaceous greens, we will find our little woolly bears again active and "on the job" with their appetites. By Maytime they will have attained the full measure of their growth. If we watch a woolly bear at this time, we will find that before changing to the pupal stage it will proceed to spin its cocoon, interweaving it with hairs plucked from its body. Shut up in this snug retreat it will quickly became a pupa, and in two or three weeks come forth a tiger moth complete. That is the story of our tiger moth.

Winners of American Nature Association

"LAND OF THE NOBLE FREE".



"I love thy rocks—and rills,"

The five judges, voting separately and by mail, were unanimous in the selection of Mrs. McCabe's "Land of the Noble Free" as the winning cartoon.

FIRST PRIZE

goes to Mrs. Florence Gibson McCabe of Grants Pass, Oregon. She writes that after several years of study at the Art Institute of Chicago, "I subsisted by making beautiful pictures of box cars, corn flakes, pork and beans, etc." Then along came a persuasive young man and she forsook the skyscrapers for the tall timber. "My studio is all outdoors," she writes, "my skylight the heavens themselves." This is her first cartoon although an artist by profession.

AND THE BLOW ALMOST KILLED MOTHER—By Craig Fox

ONE IN A MILLION!
NOW HAZEL, YOU PICK UP ALL TH' BOXES, TIN CANS AND BOTTLES AND JUNIOR, YOU GATHER UP ALL TH' PAPERS THEN PAPA WILL BURN THEM AND PUT OUT TH' FIRE, REMEMBER WE WANT TO LEAVE THIS BEAUTIFUL SPOT AS CLEAN AND NEAT AS WE FOUND IT!
MOTHER NATURE
"GOOD MANNERS" FAMILY
Craig Fox

FIVE ADDITIONAL HONORABLE MENTION PRIZES WILL BE ANNOUNCED IN THE JULY ISSUE.

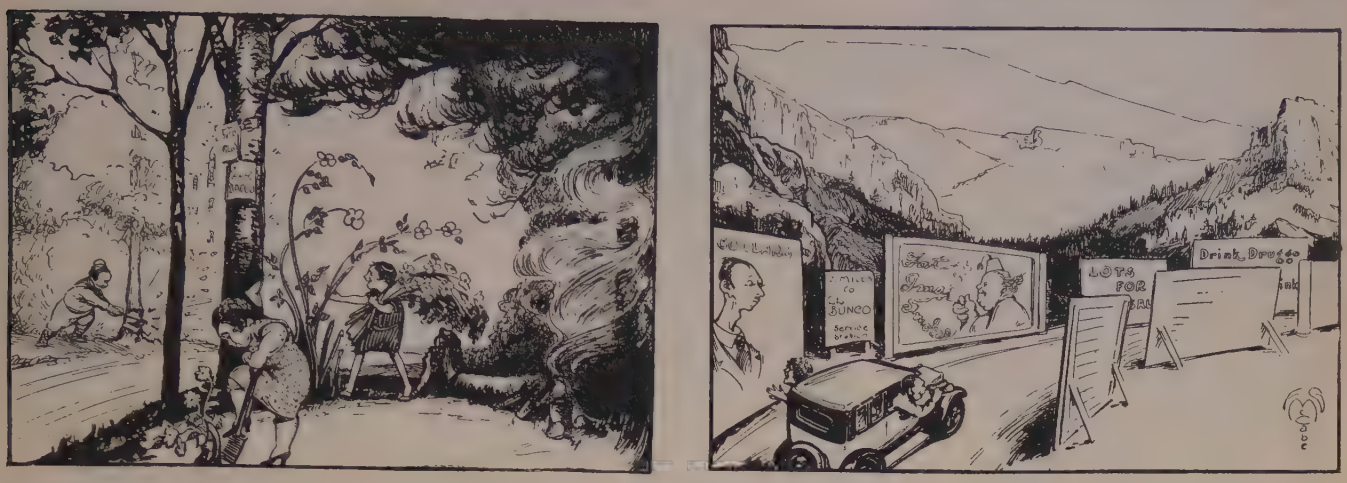
SECOND PRIZE

goes to Craig Fox, the cartoonist of the Rochester, N. Y., *Democrat-Chronicle*. He says the cartooning bug bit him when 14 and he has been at it ever since, the last 15 years at his present post. His favorite sports are fishing in Lake Ontario and motoring in New York. His hobby is cartooning.

Fox, by Himself

Outdoor Good Manners Cartoon Contest

BY FLORENCE G. Mc CABE



"Thy woods—and templed hills".

CONTEST GREAT SUCCESS

CARTOONISTS from all over the United States answered the American Nature Association's call for Outdoor Good Manners Cartoons directed against the various desecrations of our highways and the out-of-doors. The first three prize awards of $100, $50 and $25 are shown on these pages. The Association wishes, however, to express its appreciation to all those who entered the contest. A number of other cartoons will be reproduced and membership in the Association given, as announced in the rules.

AMATEUR CONTEST

The amateur class in the contest closes on June 1. Hundreds of cartoons have been received but it is hoped to announce the winners in the September issue of Nature Magazine.

HANDICAPPED—By John M. Hix

THIRD PRIZE goes to John M. Hix, the youthful cartoonist of the Washington, D. C., *Times*. Mr. Hix will be 20 in June and he seems to have been born with a pen in his hand and has been cartooning ever since the days when he carried papers in his native Greenville, S. C. He draws "Hicks by Hix," a syndicated cartoon.

Hix, by Jim Ring

The Chimney Swifts' Rendezvous

By Joel G. Winkjer

(Silhouettes by Joe Cranstoun Jones)

The Moon Lays a Silvery Aisle Across the Waters

From time immemorial Gah-mi-squa-wa-ko-kag Saga-eegan was the rendezvous of the Indian. So much had transpired by the shores of this lake in ages gone by that it was also the favorite haunting place of the spirits. They chose the shady places and thronged the dark enchanted recesses of the majestic forest. They floated in the air, through the branches of the stately pines and whispered the song of the lover or moaned a dirge.

When the storm raged the spirit of the deep ventured out and became almost visible as the wind whipped the waves into a white mist. Sometimes the red man became its victim and was dragged into the mysterious depths. Then, again, the moon sent her intermittent enchanting rays from behind dark flitting clouds, laying a silvery aisle across the placid waters where the spirit of good danced with joy over having destroyed those of the storm and driven them back into the lake or the overhanging forest.

The coming of the white man ended the days of the spirits. The timberman's axe gave no peace to the wood-nymph. The fireshooting iron steed conquered the most diabolical spirit. On land and lake the piercing lights and sputtering motors gave these ethereal beings not a chance.

As the spirits vanished so the natives lost their hold on the savage life. Where they had their pow-wows and war dances there is now a city, a part descendants of Indians.

As old as the spirits or the Indians is the chimney swift, that skimming savage of the sky. He has not been subdued. The coming of the city changed his habits not a bit. In fact, these birds have adapted the city to their savage life; their customs, their traditions are all the same as of old. During their yearly summer pilgrimage to the land of the long twilight and early dawn they may be seen at the close of the day, holding their pow-wows over the city, darting and skimming as they gather, keeping up a constant chip-chip-chir-r-r-r that seems to fill the universe.

When thousands have gathered, the command to execute the ancient traditional grand whirl is given. This ends up like a cyclone-like funnel that leads into the "sacred" chimney where the swifts fall and disappear by the scores and dozens, each in turn disappearing in the chimney, each growing smaller with the evening. As darkness descends they come by threes or fours, by twos or alone; at first heard by a faint "peep" the pilot's signal from the distance, then their louder chirp tells that they are here. The silence that follows the ritual tells that the last stragglers have joined the thousands and thousands of others in their nightly rendezvous.

Who knows but that, like the old Indian who refuses to give up the ancient traditions, these savage stragglers haunt some secluded and secret nook where they are still in communion with the spirits that in the past santified the shores of Gahumi-squa-wa-ko-kag Saga-eegan.

They Come By Threes and Fours, By Twos and Alone

GAH - MI - SQUA - WA - KO - KAG SAGA-EEGAN MEANS THE LAKE-OF-THE-RED-CEDAR, THE INDIAN NAME FOR CASS LAKE, MINNESOTA.

PHOTOGRAPH U. S. FOREST SERVICE

WINTER IS A SAFE SEASON FOR THIS PROCESS
In the hot, dry spells of summer the burning of brush and slashings is too dangerous to be approved by foresters.

THE THIRST OF THE AIR

By Charles Fitzhugh Talman
U. S. Weather Bureau

IT is estimated that something like sixteen million tons of rain and snow falls upon the surface of the earth, on an average, every second. Day after day, year after year, and century after century this prodigious downpour goes on; yet the oceans get no fuller, the land, as a whole, gets no damper, and—strangest of all—the atmosphere, despite this tremendous drainage of its moisture, gets no drier. The explanation of the paradox is, of course, found in the process that we call evaporation.

Everybody knows, in a general way, that water evaporates, but few people realize that the amount of evaporation that occurs throughout the world is, in the long run, exactly equal to the world's rainfall. For every ton of water that falls upon the globe a ton passes off, in the form of a gas or vapor, into the air, though not, as a rule, at the same place where it fell. The oceans, lakes and rivers generally lose a good deal more water by evaporation than they receive directly as rain. The lands, for the most part, lose less by this process, though a tract of land covered with luxuriant vegetation, especially with forests, vies with a corresponding area of water in the amount of moisture it supplies to the air, because plants gather water underground with their far-spreading roots, pump it up through their stems and trunks, and breathe it out through their innumerable pores.

Evaporation is a complex process, and a whole library of books and scientific articles has been devoted to its elucidation, but from the layman's standpoint it may be said that the amount of water evaporated at any time and place depends upon two things. The first is the supply of water available. In a desert there is little evaporation, because there is rarely any moisture at the surface of the ground. Elsewhere on land different soils differ in their capacity for holding water after a rain and for lifting it from the lower levels by the action known as "capillarity"; hence some are more conducive to evaporation than others. Both snow and ice evaporate; sometimes with astonishing rapidity. When the temperature is below the freezing-point, their moisture changes

When you read that there has been an inch of rainfall, this means, in terms of weight, that 113 tons of rain has fallen on each acre of surface. In Washington, D. C., for example, forty-three inches a year is the average rainfall. Now, get out your paper and pencil, read Mr. Talman's article and do some figuring about the thirst of the air.

PHOTOGRAPH U. S. FOREST SERVICE

NIPPING THE FIRE IN THE BUD WITH A WET BLANKET
When "fire weather" prevails the forest rangers are doubly vigilant, as a small blaze quickly gets beyond control.

directly from the solid to the gaseous form, without becoming liquid. Oceans and other bodies of water afford an unlimited supply of moisture for evaporation.

The other thing that controls evaporation is a combination of physical conditions that we choose to call, for our present purpose, the "thirst of the air." In scientific language it is sometimes termed "evaporativity." Air that is dry (deficient in the invisible gas called "water vapor") is thirsty. Warm it and you increase its thirst. Set it in motion, and you make it thirstier still. In other words, humidity, temperature and wind are all factors of evaporativity, and there are still others that need not be considered here.

The effects of atmospheric thirst are numerous and striking. When it is excessive it may cause plants to wilt even when they are supplied with abundant water from the soil. Thus a well-irrigated orange grove is sometimes much injured by a hot, dry wind. It has various physiological effects upon man and the lower animals. They are, for example, made thirsty by a

PHOTOGRAPH U. S. FOREST SERVICE

AN INDICATOR OF FIRE HAZARD
Hygrometer for measuring the moisture in the forest litter, and thus determining its inflammability.

thirsty atmosphere. In the terrific summer climate of Death Valley, California—one of the hottest and driest on earth—the traveler finds it impossible to drink enough water to slake his thirst. A thirsty air takes tremendous toll of the water stored in irrigation reservoirs, which must be designed to make allowance for this loss. On the other hand, it is the thirst of the air that enables the California fruit-growers to dry their products out of doors in the long, rainless summers; lumbermen everywhere to season their boards; and housewives to dry the family wash. Artificial conditions may either increase or diminish the drying power of the air. Many industries depend upon the use of drying machinery, while there are others in which artificially moistened air must be supplied for certain operations.

PHOTOGRAPH U. S. FOREST SERVICE

A SHELTER FROM PARCHING WINDS
A windbreak of cypress, which protects a California orange grove from excessive drying, or "wind burn."

The amount of moisture in the air is measured by instruments, of many different patterns, called "hygrometers." Instruments for measuring the thirst of the air are called "atmometers," or "evaporimeters." One of the common forms of evaporation-measure is a large circular metal pan, in which water is exposed to the air. The depth of the water is measured from time to time; allowance is made for any rain that may have fallen between observations (as determined by a rain-gauge); and the depth of water evaporated is thus obtained. Measurements made with this device are especially useful for engineering purposes. In studying the drying effects of the atmosphere upon plants, botanists use instruments of a very different type, in which evaporation takes place from a porous surface.

One of the most remarkable series of evaporation measurements ever made was the result of a disastrous flood that occurred in the desert region of southern California in the year 1905. The breaking of dams constructed in connection with an irrigation project allowed the water of the Colorado River to flow into a large depression, below sea-level, known as the Salton Sink. By the time the break was closed, at the end of 1906, the flood had formed a lake 475 square miles in extent—the Salton Sea. After its principal supply of water was cut off, the lake diminished rapidly in depth and area for many years, on account of the great excess of evaporation over the very scanty rainfall. The Weather Bureau installed elaborate apparatus here and utilized the Salton Sea as a mammoth evaporation-pan; the measurements showing an average evaporation from its surface of nearly seventy inches a year. This figure, large as it is, does not adequately represent the evaporativity of the region. The blanket of water vapor that forms over a large body of water prevents the wind from exercising its full effect in promoting evaporation, and measurements made with isolated pans in the same desert give values nearly twice as great. Even more remarkable are the measurements made under the almost cloudless skies of the upper Nile Valley, in Egypt, where, at Wadi Halfa, the depth of water evaporated amounts to more than 19 feet a year!

It is common to think of an arid region as one having merely a deficient rainfall, but it is the prevailing dryness of the atmosphere that gives to such regions some of their most striking characteristics. The typical vegetation of a dry climate is conspicuously adapted to preventing harmful loss of water by evaporation; leaves are often small or lacking, or they have thick tissues for storing water, protected by a leathery cuticle. Of some other effects of aridity Dr. Billings says, in describing the climate of Yuma, Arizona: "The air is so dry that the skin becomes dry and hard, and the hair crisp. The furniture falls to pieces. Newspapers have to be handled with the greatest care, and a No. 2 Faber pencil leaves

no more trace on paper than a piece of anthracite."

Rivers flowing into deserts wither away under the effects of evaporation. As water vapor is a great absorber of radiation, this gas serves to temper the ardor of the sun's rays by day and to check the loss of heat from the earth by night, and its deficiency, in a dry climate, results in a large diurnal range of temperature. In the southern Sahara, which is a veritable furnace in the daytime, it is not uncommon to find water at the surface of the ground frozen in the early morning. Lastly, dry air contains few microörganisms and thus acts as an antiseptic; whence it happens that "jerked beef" keeps indefinitely in the southwestern United States and that the Egyptian and Peruvian mummies have been preserved through the centuries.

In recent years we have heard a great deal about the "desert" air found in American schoolhouses and other buildings in winter, and its harmful effects upon human health and efficiency. While it is true that the air in question is as dry as that of a desert, the conclusions drawn from this fact are probably misleading. In a desert the drying effect of the atmosphere is greatly increased by the winds; the temperatures are, at times, much higher than those prevailing in our buildings; and there is often a large amount of dust in the air to irritate the breathing passages. Moreover, notwithstanding these disadvantages of the desert as compared with the furnace-heated schoolroom, a typical desert climate is not unhealthful. If it were, Egypt and Arizona would hardly enjoy their present reputations as resorts for the victims of pulmonary tuberculosis, bronchitis and other ailments.

The New York State Commission on Ventilation made a number of experiments in supplying moisture to the air of schoolrooms, and reached the conclusion that this process produces no marked improvement in either the health or the efficiency of the children. Its principal observed effect was to make the air "stuffy" and disagreeable. There are, however, some sound arguments against maintaining a Saharan climate indoors. It is bad for furniture and book-bindings, and it is wasteful of fuel. More moisture in the atmosphere ensures the same degree of comfort at a lower temperature, and thus cuts down the coal bill.

PHOTOGRAPH U. S. BUREAU OF RECLAMATION

VEGETATION ADAPTED TO A THIRSTY ATMOSPHERE
Compare the evaporating surface of this cactus with that of an ordinary leaf-bearing tree or bush.

The desiccating winds that prevail at times in certain parts of the world are quite celebrated for their effects. The foehn of the Alps and the chinook of the eastern Rocky Mountain slope—winds of identical character under different names—have the reputation of being hungry as well as thirsty, for the nickname "snow-eater" is applied to them both. This name refers to the magical speed with which snow disappears when exposed to these blasts, which blow down from the mountains and are heated and dried by compression. The chinook is credited with the feat of devouring a foot of snow in a few hours, without leaving a trickle of water behind. While it is welcomed by the cattlemen, its parching breath increases the danger of forest fires. Similarly, in the Swiss valleys, the foehn reduces all woodwork to the condition of matchwood, and there are localities where the authorities forbid the lighting of fires of any kind—even to the smoking of a cigarette—while the wind is blowing.

The so-called "hot winds of the Plains" are a scourge of agriculture in the western United States east of the Rockies. Concerning the havoc caused by their dry heat, Professor R. DeC. Ward writes:

"Not only is moisture evaporated from the soil, but growing vegetation is literally dried out as it stands. If

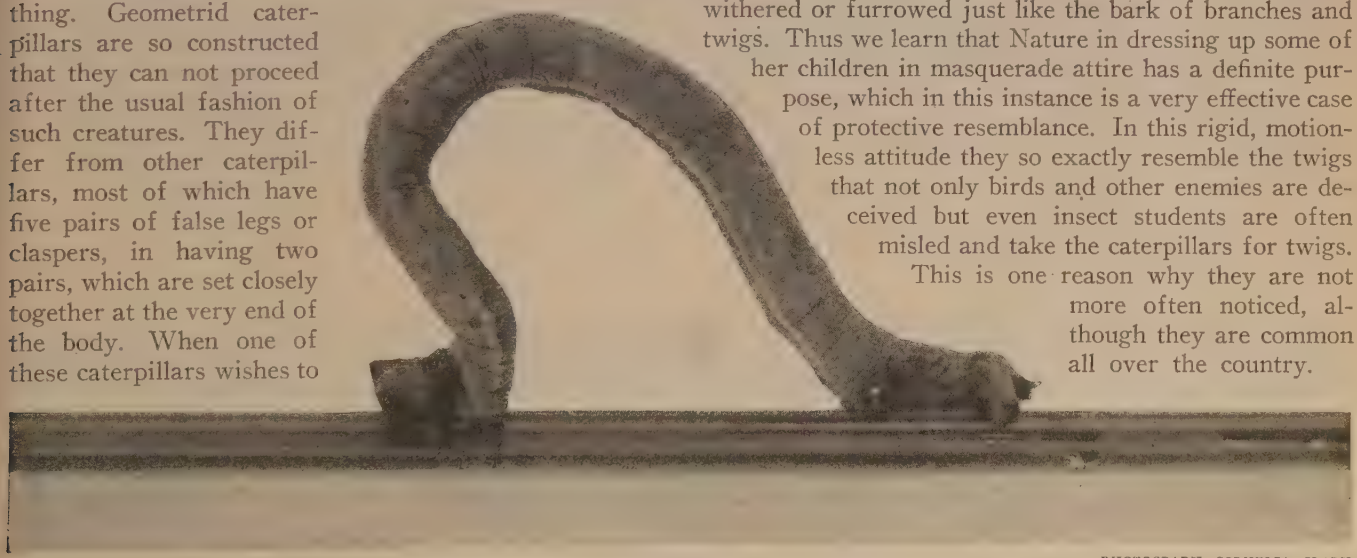
the hot winds happen to come at a critical period in the growth of a crop, they may cause heavy damage within a few hours. In one case of recurring hot winds in Kansas some years ago, over 10,000,000 bushels of corn was ruined, and the crop was reduced by 10,000,000 more. Vegetation withers; leaves crumble to dust at the touch; corn, wheat and other cereals look as if they had been scorched by fires; apples are described as being baked while hanging on the trees." Southern Australia is afflicted with "hot winds" of equal severity.

Dry air is an essential condition of big forest fires. Lightning often starts them, and wind spreads them; but low humidity—the thirst of the air—is the most important element in what has come to be called, in recent years, "fire weather." The Weather Bureau, the Forest Service and various local organizations interested in forest protection have joined forces in making a thorough study of such weather, and in maintaining special arrangements for predicting it. This undertaking was launched in the Far West in 1914 and has since been extended to all forested regions of the country. Thus the reading of hygrometers has become a routine task of foresters, and rather striking relations have been discovered between these instruments and forest fires.

"What's in A Name?"

ONE answer to this well-known query may be found in the host of names given to the caterpillars or larvae of a large family of moths. There are various common, general and local names applied to these insects, among which we find "spanworms," "measuring worms," "inchworms," "measurers," "loopers" and "surveyors." Scientifically their family name is *Geometridæ*, meaning "earth measurers." Their peculiar gait having gained for them all of these names, because they seem to measure the road over which they travel, thus we find that a number of different names may mean virtually one and the same thing. Geometrid caterpillars are so constructed that they can not proceed after the usual fashion of such creatures. They differ from other caterpillars, most of which have five pairs of false legs or claspers, in having two pairs, which are set closely together at the very end of the body. When one of these caterpillars wishes to move, it clings very firmly with its six true legs which are on the segments close to the head; it loosens the grasp of its claspers at the hind end and draws them close to the true legs, so that the body between is arched into the form of a loop. The claspers are then fixed tightly to the object on which the caterpillar is moving, and the body is stretched out again in order to find a fresh foothold for the true legs. This mode of progression is not ungraceful, and the caterpillar forming its loops in quick succession gets along at a remarkable pace.

As wonderful as their mode of locomotion is their attitude when at rest. Many of these caterpillars pass a large part of their time stretched out at full length with the body motionless and rigid. Often at an angle to the twig or leaf on which they are clinging by the hinder two pair of claspers, they look amazingly like a short or broken twig. Their skins are never hairy but are colored brown like bark with tints of yellow, green and gray, knobbed or scarred like buds and leaf scars, and withered or furrowed just like the bark of branches and twigs. Thus we learn that Nature in dressing up some of her children in masquerade attire has a definite purpose, which in this instance is a very effective case of protective resemblance. In this rigid, motionless attitude they so exactly resemble the twigs that not only birds and other enemies are deceived but even insect students are often misled and take the caterpillars for twigs. This is one reason why they are not more often noticed, although they are common all over the country.



PHOTOGRAPH CORNELIA CLARK

A CATERPILLAR OF VARIED NAMES
His strange methods of locomotion have earned him and his relatives an interesting collection of titles.

Feeding upon the foliage of a great variety of plants, a few of the *Geometridæ* are troublesome pests. Perhaps the best known of these are the "canker worms." The moths of most of the species are known by their slender bodies, small heads and very broad wings, which are also frail and thin. The female moths of some of the species, such as the "canker worms," are wingless.

Can Chameleons Think?

By George W. Smith, M. D.
(Photographs by Post)

LIZZIE AWAITS THE COMMAND TO JUMP
Below she and her team mate, Dryden, have taken to the see saw, which they seem to enjoy greatly.

LIZZIE came to me in May, and Dryden became her team mate in September. They came from Florida but they could tell me nothing about their former home because they are only chameleons. Having worked with them as schoolmaster, however, I would omit the word "only" because they have shown such aptitude for learning that it puts them out of the *only* class.

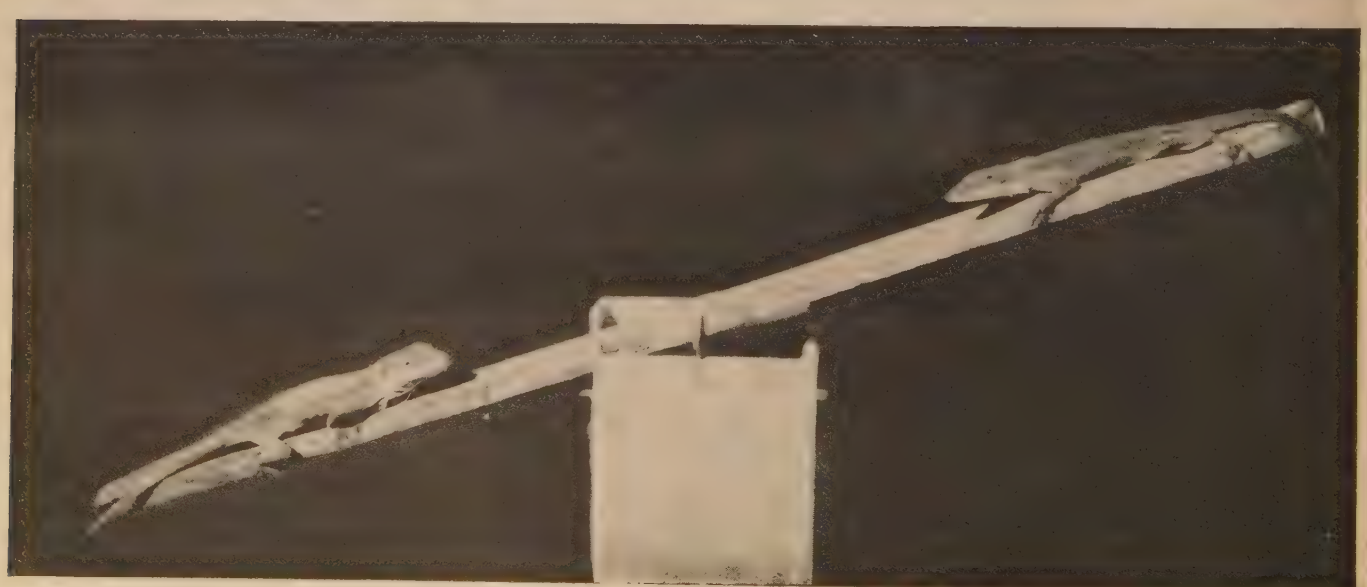
As we well know, the name chameleon tells a story itself and these little fellows possess the power of changing their skin to two shades of brown and two shades of green. Lizzie, also, may make herself gray or darkly spotted, while Dryden, to show his colors, has been noticed to be yellow at times, and once was observed to be pure white. By the electric light at night they are brilliantly colored.

One day a patient declared that Lizzie knew my voice among all others and was "a smart little creature." I decided to find out about this. I first gained Lizzie's confidence by feeding her live common house flies. She took these morsels from my fingers while I stroked her over the head and under the chin. Soon she readily perched on my hand.

Then I started a training course, the first stunt being jumping. It was necessary only to have her understand she was not to jump until the command, "jump," was given. Patience was required, but much to my surprise she mastered the trick easily. Two blocks, one blue and one red, were provided. Lizzie was taught which was antipathy toward the red. Placing her on the blue block and ordering her to jump to the red, I had hard work to get her to obey, but when I taught her, "turn," she did so readily, and returned to the blue one without urging when ordered. Why red is so unpopular with her, I do not know because she will go to bed in red flannel in cold weather.

Her next lesson was to learn to enter a little swing I made for her. She enjoys this now, and deserts the blue block when ordered to "get in your swing." When the words "teeter totter" are spoken, Lizzie quits the swing quickly for the see saw. After the teeter totter, with Dryden as her playmate, they both hurriedly climb a small pole, racing to see which will reach the top first. At the word "turn" they race to the opposite end. Waiting the command, "jump," they hop to a large lace curtain to await the petting which is always the reward.

When I first received Dryden, he was a fighter, and would grab your finger and hang on for dear life. A few sharp commands stopped that. Being affectionate he wanted to jump from my hand to my cravat, so it was easy to interpose a hoop through which he jumped at the command to jump. To repay him I have him mount a larger hoop made of cardboard, and give him the same motion a child gets in a baby jumper, a movement which he so enjoys that he is loath to leave the hoop. I ask again: Can chameleons think?



Up Stream With the Alewives

By
EDITH M.
PATCH
of the
University
of Maine

PHOTOGRAPH BY THE AUTHOR

IT WAS A PLACE FOR SOLITUDE
The migrations of the finny wanderers of the streams came to an end at the Upper Pond.

PERHAPS, if the alewife had been differently named, poets would have sung of its beauty and made epics of its travels. Better than a poem, however, is the experience of lifting one of these fish from the water and holding it to the light for a moment before releasing it to continue on its strange journey. It is worth a memory to hold in the hand a spirit of Spring: a living mosaic with jewels flatly pressed and overlapping, blue-black gems near the back, then amethysts brilliant and deep, then gleaming hundreds of opals fading to pearls.

When the fish slips into water again, its colors are lost. There is little more to be seen than its dull dark blue back so near the surface of the water that the dorsal fin is exposed like a wee black sail unfurled.

Hard by are thousands of similar sails, a fleet of small black fins voyaging from ocean depths up stream to the ponds. For Spring has called the alewives. Who knows how? Let a physiologist fathom their reactions if he can. It is not for a mere naturalist to guess how the alewives feel when they steer their fleets toward fresh water where their little black sails, in annual millions, pass up the Atlantic streams.

The scent of arbutus is still in the air when they come, the elder buds, in purple cones, are nearly ready to burst into cream white bloom, and the maple blossoms are hanging red; but I doubt that the scent or color of flower reaches the alewives in the sea. The frogs are in full chorus, the toads are trilling, the bobolinks are jubilant with northland joys, the meadow larks are calling "Spring is here"; but I doubt that song of batrachian or of bird quickens the alewives in their ocean depths.

Yet somehow Spring touches them intimately, impelling, and the alewives can no more resist their impulse to migrate to fresh water than the bobolinks can refrain from their northward flight. The birds that come four thousand miles for a nesting site have, I think, an easier journey than the fish; for however smooth their way may be during their ocean voyage, the alewives that venture into a certain Maine brook head into a hazardous course when they enter fresh water.

Pausing one day in mid-May at the mouth of Patten's Pond Stream, I glanced down upon a fleet of little black sails. Countless thousands of alewives were waving their dorsal fins above the surface of the water in Surry Bay just where it was rippled by the rapids of the stream. The fish were held until the rise of the tide. As they waited there, not deliberately of course, but blindly, they seemed a parable. How often we wait, as unwittingly as they, for the turn in some inscrutable tide.

The fate of that fleet suddenly gripped my imagination with its pathos, its exhilaration. The refrain of a passing meadow lark reminded me that pathos was a false note, sung out of key by a foolish human dread of the dangers that were ahead. So I choked that back and resolved to follow the fortunes of the alewives from sea to pond joyously as a Spring adventure.

The water in the bay was calm and shining under

the morning sun. The birches on the near shore still showed that grace of line and tracery against the vivid sky that is theirs before the buds burst bounds and hide the twigs behind their shimmering green. Across the bay, pine and cedar and fir dotted the slope with dark shades that accentuated the delicacy of spring tints. From shore to shore stretched a white line of waiting gulls.

The tide was low and the water gushed out of the mouth of the stream over rocks that were too high for the fish to climb. The leaders of the eager migrants pushed up into the fresh water as far as possible before they paused, edging into easier eddies at the right of the main stream.

PHOTOGRAPH BY C. H. WHITE

ALEWIFE OR RIVER HERRING
When taken from the water at Surry, Maine, this fish measured thirteen inches, tip to tip.

The adventure of following the alewives, it seemed, was for the present somewhat whimsically an affair of inaction. Well, if the fish could wait and the gulls could wait, I could.

The slow tide came in. The eager alewives began to mount the rapids. The gulls circled up and pounced down. The birds were not lovely to watch while they fed upon the flapping fish they dragged to the shore. Their curdling screams may have voiced a mad joy at the sight of food, or they may have expressed frantic warnings to their fellows to give way to desperate comrades. It was their right to feast. They had waited the turn of the tide and there were so many thousands of fish. But their weird racket cut through my logic to my heart and I went down to the edge of the rocks. The gulls lifted a wail of anger and disappointment but I refused to give heed. After all, my self-appointed adventure was not with the gulls but with the fish, and while I stood guard near the entrance of the stream the alewives mounted the initial rapids unmolested.

When the swift and swirling water threw one of them out of balance the fish would often fight up and over a rock sidewise, perhaps getting a purchase with its fins and the saw-edge of its belly against the irregularities in the surface of the rock. That was a comparatively slow process during which its silver side shone through the shallow water. The normal way for one to mount, however, was to shoot straight up the current, back up and belly down. This was done in a flash, the back showing under the water a "blue streak" as it went. An alewife does not leap clear of the water to jump the rapids as a salmon or trout does but takes its chances, head into the current.

Again and again the migrants were tossed back by the water. Again and again they made undaunted efforts. Even those—and they were very many—whose backs and sides had been torn open by the gulls kept steadfastly to their purpose. Courage and almost inconceivable patience are the terms one naturally applies to their performance. Yet as I watched I wondered whether either virtue, as humanly considered, had anything to do with an alewife's endeavor. Was it not, rather, desire that led them up the stream—whelming desire possessing the fish physically and, as much as may be, mentally? Watching them, I hoped so. Courage and patience seemed too inadequate, too pathetic a vista through which to view them. It needed some-

PHOTOGRAPH BY THE AUTHOR

THE GULLS WAITED THE TURN OF THE TIDE
When the waters came in and the eager fish started to mount the rapids the gulls circled and pounced.

thing more fundamental, more relentless, more unwavering and less sad to explain a struggle like this. There must be, to guide them, desire, sufficient in itself, its gratification its own reward. I could not believe that Nature forced such an annual issue without inherent compensation. And, though the alewife must mount the stream or die in the attempt, there was no reason why I should mix human psychology with its journey. It must be that each movement of its splendid body was made in physical enjoyment of even the struggle. And once up the rapids the quiet water above was a comforting place for resting.

The alewives gathered in such placid stretches after their initial triumph, their numbers increasing until their black dorsal fins showed a fleet filling the quiet water. After a respite they swam on and through a second series of rapids a few rods up stream.

They rested again near Surry bridge and thousands of the fish went no farther on their journey. A fate more potent, if less spectacular than the gulls met them here. Mankind took a large economic toll. I liked to note that, while his livelihood was linked with his catch of alewives, the captain who directed their affairs at the bridge looked kindly at such of the fish as were permitted to pass on. He moved lodged bits of wood to give them easier passage. He shifted stones to widen a resting pool. When tormenting youngsters were inclined to disturb the fish he prevented them, saying "Don't do it, boys. They have a hard enough time as it is."

Indeed, the whole course looked to a bystander like an obstacle race; though I surmise that had the alewives voices they would have gone up stream singing. It helped me, somehow, to listen to the bobolinks that had concluded their migration as I watched these other voyagers still with a long, long way to go.

Not long as miles are measured, for it is about three miles from Surry Bay to Patten's Pond. But long in hours when the weather is cold, for it took the fish a week to climb the half mile between Surry Bridge and Six-foot Falls.

An old willow, leafless still, stood beside the rapids a little way beyond the bridge. How many springs had its bare branches reached over the migrant parents as they went up towards the ponds, and how many summers had its leaves shaded the migrant young as they came down towards the sea? The tree looked so large and lasting. An alewife looked so small and fleeting. Yet the life of the willow was a mere hour in the stretch of years during which alewives had been coming and going on their annual way.

PHOTOGRAPH BY THE AUTHOR

A BARRIER OF GUSHING WATER
When the tide was low the stream's mouth gushed and the rocks were too high for the fish to climb.

It was, indeed, a place for solitude. A group of leafless birches stood at the brook's brim, their trunks tall and slender and white against the dark neighboring evergreens and their reflections shimmering in the water.

The dark fins of many alewives showed in quiet places and at the falls the fish were nosing into the rapids. Their attempts, rebuffs, repeated efforts, ultimate successes, stirred my imagination and admiration as they had at the initial rapids at the mouth of the stream. I found myself again praising their courage and patient endeavor. And again, as the fish sped up into the strong tumbling water, I was reminded that not courage but something more steadfast led these migrants irresistibly on their way. Each fish, as it conquered the rapids, seemed glad of body.

It was, this season, a fortnight's journey for the fasting alewives from the sea to the mill pond, a distance of about two miles as men reckon it. The mill, with its cellar of gushing torrents and bewildering detours, held many handicaps and not a few tragedies; but most of the fish fought through and around and then up a sluiceway into the Mill Pond, the first in a chain of three lakes.

Once in placid water, would the fish stay? Was not one pool as good as another? Evidently not, to journeying alewives. They must be moving again, after a

rest. Perhaps the sound of water roaring at the dam challenged them to yet another victory. Perhaps the feel of the incoming current lured them to even better waters for their errand. At any rate on to the dam they swam and there again made difficult passage. They could not know that they now had their ultimate triumph over the wayward stream, and that the last serious obstacle in their fresh water race was behind them. But I knew it and felt strangely relieved.

While I stood looking across the water of the Lower Pond, my eyes resting on a pleasant island and then beyond to the strong hills, a glad sound, not soon to be forgotten, poured into the June day. Above me in the branches of some old birches more than twenty purple finches, rich of hue and melodious of voice, were in full chorus, filling the air with their song of June.

The songless fish in the water below—had they some quiver of Springtime joy? I liked to think they had while they were on their now quiet trail which led to one more pond, the third.

In the woods not far from the shore of that Upper Pond was a brown bent stem of a last year's braken fern. Under the fern there was a brown nest lined with the dry spills of white pine. In the nest were the green-blue eggs which betokened that a pair of hermit thrushes had reached their migration's end.

The migrations of the finny wanderers had also come to an end; and in due time their eggs would be entrusted to that watery cradle which is the annual goal of alewives, passing up stream from sea to pond.

A Giant Silkworm

CATERPILLARS are often miscalled "worms," but to be technically and scientifically correct we should call them "larvae." The caterpillar or larval stage is the period in life during which an insect feeds and increases in size. The insect's body is composed of thirteen rings or segments of which the three foremost, excepting the head, form the thorax. These three thoracic rings are each furnished with a pair of legs which correspond to the six legs of the future perfect insect. The rings from the third to the eleventh inclusive are provided on either side with small openings to admit air. These openings are connected with the breathing apparatus. Supporting the body at the middle we usually find four sets of false legs or prolegs, while another pair, called the anal prolegs, support the hind end.

PHOTOGRAPH CORNELIA CLARKE

THE BEAUTIFUL CECROPIA CATERPILLAR
This largest of our giant silk worms is vividly colored and is a most interesting "worm."

Some caterpillars are really handsome. The largest of our giant silkworms, the Cecropia caterpillar (*Samia cecropia*), is a beautiful creature, often measuring four inches in length when full grown. Conspicuous fleshy protuberances or knobs that are illuminated with vivid colors, such as coral red, yellow, and blue, adorn the body, itself a delicate bluish green. There are six rows of these tubercles or knobs extending nearly its entire length, while there is a partial row on each lower side.

Living exposed on a great variety of trees and shrubs, the Cecropia caterpillar feeds upon the leaves, casting its skin from time to time as it grows. It is a conspicuous creature and often attracts considerable attention on account of its large size and beautiful coloration, although seldom occurring in numbers great enough to cause serious injury. This caterpillar is a cocoon-maker; in fact, there are two cocoons, one inside the other, an arrangement to protect the transforming insect from enemies, weather conditions and great changes in temperature. The silk from the cocoons of this species does not yet have a high commercial value as there are difficulties in the matter of unwinding it.

Silk glands from which the silk fluid is produced resemble a pair of long tubes on each side of the interior of the caterpillar's body. These tubes unite at the lip to form the spinning organ or spinneret. The silk fluid, when drawn out, hardens rapidly when exposed to the air.

After spending the required time in the silken cocoon, changing from caterpillar to pupal stage, we finally observe the perfect moth or adult emerging. In this instance it is a Cecropia moth, the largest member of its family in this country. When the moth spreads its handsomely ornamental wings they measure perhaps five or six and one-half inches across, from tip to tip. The Cecropia moth is known from the Atlantic Coast to the Rocky Mountains, while in the West its place is taken by other species that are closely related to the Cecropia.

JACK AND JILL AT TEN WEEKS
They seriously mistrusted the camera and its companion, who took them from their log home.

Jack and Jill, the Vulture Twins

By Frank L. Yocom

PROBABLY this story of Jack and Jill, the Vulture Twins, would never have been written, if Betsy, Farmer Parsons' old brindle cow, had not refused to come up from the woods one night. But she wouldn't come, so Farmer Parsons had to go down after her. Climbing up on a large log to see over the briar patches, he finally located her, but in getting off the log he stepped on a rotten spot and his foot went through to its hollow heart. Slipping into a hollow log would surprise any of us, but when a large black bird, with no feathers on its head, ran from the end of the log and with a defiant hiss, sprang into the air and flew away into the dusk, —well, Farmer Parsons said, "I s'num."

His suspicions were aroused. He looked into the log through the hole that his foot had made and there on the bottom were two little creatures all covered with downy white feathers. Around them were broken bits of egg shell from which they had recently emerged. Thus it was that Jack and Jill, the Vulture Twins, were discovered in the place that was to be their home for more than one hundred days.

JILL AT HER FRONT DOOR
At the age of ten weeks she had a spread of wing that measured sixty-two inches.

Their growth was very remarkable. The first two weeks they grew from the size of the egg to almost twice that size. But there was one thing about them that would not change—their coats. Still downy and white they appeared in contrast with the dark of the parent birds which came to the nest to feed their offspring.

The first eight weeks of their lives they lived almost in seclusion. Only Farmer Parsons visited them, and he only occasionally. They grew larger and their wings began to expand. Here and there a few black dots began to appear among their feathers, indicating that soon their coats of down were to give way to dark brown feathers like those of their par-

ents. Only their heads remained the same, and these were still without feathers. Occasionally there were fights between the twins, and Jack, being the larger of the two, was always the victor. The parent birds interestedly watched these struggles from their perch on a high limb of a dead tree that stood guard over the log.

The eighth week of their lives passed, and then the camera man came. How they despised the camera man! It was a late July Sunday morning when he first visited the nest. There was no escape from this being who first took Jack from his log home and then caught Jill as she crouched on the bottom of the log, directly beneath the hole made by Farmer Parsons' foot. They were placed side by side on the top of the log. This was something new! What a large world to live in compared with a log, even though it was thirty feet long and about four feet high!

DEFIANT IN THE FACE OF THE CAMERA
They were belligerent but as yet they had not learned the various ways of protecting themselves.

As the twins stood there on the top of their log home, admiring this new world into which the camera man had put them, they were startled by a click. It was too late to jump, because the picture had been taken. Instinct told them to fly, but their wings were not strong enough to carry their heavy bodies through the air. So the best they could do was to try to run away and hide in the nearby bushes. But Bob and Ed, the camera man's helpers, were on the job and brought them back. Time and again the camera clicked, and they objected as most modest birds would, but they had not yet learned all of their protective powers. Finally however, they were returned to their log, not to be molested again until the next Sunday.

So seven weeks passed. Each was marked by a visit from the camera man, and each visit found the twins larger and stronger. Their downy white plumage was fast disappearing, and in its place came a coat of heavy, dark brown feathers.

Quite often, when they thought themselves unobserved, they ventured to the mouth of their large log and looked out into the world about them. At such times they appeared very small and hardly able to make their way in the outer world into which they were soon to venture. But they would flap their wings and hiss at each other as much as to say, "Just wait until I get a chance, and I'll show you."

They were also learning that they had means of protecting themselves. Their bills were becoming hard and sharp to pick meat from bones of dead animals, because that is the way the vultures get their food. Their talons were also becoming sharp. They had yet another means of protection. This is not physically injurious like a scratch from a talon or a bite from the bill, but it is decidedly unpleasant. They have the power to regurgitate partly-digested food, and, as it was decayed before it ever entered the bird's stomach, it is most disagreeable and a very effective means of making humans and other enemies keep their distance.

How much longer would these birds be satisfied with a log home? Already they had learned how to fly and they needed only more strength and practice to enable them to soar through the sky like their parents. Would they remain until the next Sunday?

The next Sunday came. With mingled emotions of doubt and fear the camera man returned to the nest. But no defiant hiss greeted him, and it was evident that Jack and Jill had flown.

JACK SHOWS OFF HIS WINGS
They had such a fine spread that they even ran out of the range of the camera.

Walking With John Burroughs

By William L. Finley

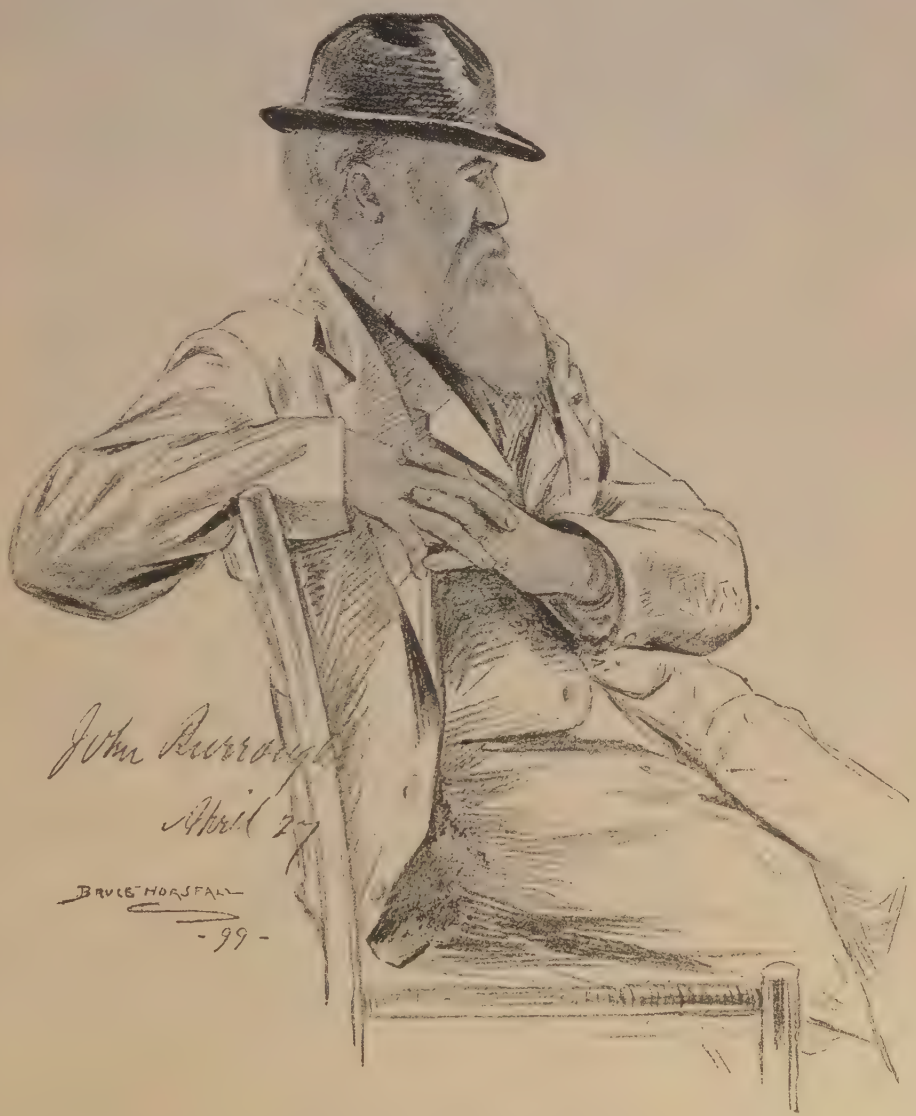
YOUTH still peered out at me in spite of his crowning thatch of silvery hair when I first met John Burroughs in 1904. As we walked together on our way to his rustic little house in the woods called "Slabsides," I got the secret that made life ever a new adventure to this aging naturalist, a secret found not in contact with the world and its bustle of new and ever-changing civilization, not with association with other people and their ideas, but rather with the silent communion with the woods and the country and wild life.

We crossed the railroad track, and, passing a neighbor's house a little dog ran out, barking a welcome and displaying canine-fashion his eagerness to join our expedition. Mr. Burroughs gave his consent by a few friendly words and so, as we climbed the hill and followed an old wagon road into the woods beyond, our dog friend was prancing around us in an ecstasy of delight and adventure. Turning off into a side trail, we found ourselves scuffling along among the brown leaves of chestnuts and maples while here and there tall hemlocks waved their soft green boughs, sighing low as a light breeze played among them. Presently we dropped down into a hollow and came upon a rustic little house, "Slabsides."

Mr. Burroughs opened the door, stepped across the rough, creaky board floor to the fireplace, raked out the coals from the ashes and soon had a big fire roaring cheerily on the hearth. He explained as he worked that his evening meal was light; that his wants had been few. He lived simply and needed little. He warmed some puffed rice in a pan before the fire and we finished with biscuits, sandwiches, crackers and milk. One piece of cake appeared but I was rather backward about accepting it. I thought that Burroughs might want it, and he did. He gave it to the dog, remarking that cake was really better for dogs.

After the meal was over, the lights were put out and we sat by the open fire talking of birds, animals, magazines, books and men. He was a good conversationalist, genial, simple and direct as in his writings. He wrote because he loved it. All he asked of life was to have enough money to live comfortably, travel a little, and still leave most of his time to write.

Born in 1837 he had spent his boyhood on a farm and had never lost his keen delight in rural life. It was bred in his bones. However, after ten years of teaching in a country school, he went to Washington as a government clerk and became a national bank examiner. In 1873 the old urge was upon him and he bought a small fruit farm on the Hudson where he afterwards spent his life, chiefly in growing grapes for the market and in philosophizing. His son says of him that he never really knew what it was to work hard and that he admitted himself that he was lazy. He would far rather sit and watch and write about the joys of out-of-doors and farming than work at the latter. Nor did he seem to work very hard in his writing, just expressing his ideas simply and clearly and not painstakingly working his ma-



JOHN BURROUGHS AT SLABSIDES
Reproduced from a pencil sketch made from life by our Art Director, R. Bruce Horsfall. (Courtesy of Century Magazine.)

terial over. For various reasons he preferred to be alone when working up his material so he went off by himself to write in his retreats and cabin.

He seemed not to have been averse to joshing callers, either, as his son tells of a piece of hemlock which he kept over his fireplace which was so grooved by the twining branch of a bittersweet which had encircled it when it was small that it had the appearance of having been actually twisted. He loved to tell gullible callers that he had twisted the stick by hand and then fastened it and dried it. Many were the chuckles which he enjoyed.

John Burroughs never was a wide traveller. He was a member of the Harriman Expedition to Alaska in 1899 going as far as Siberia, and was the companion of President Roosevelt on a trip to Yellowstone Park in 1903. He also had gone to California several times, but he did not seem to enjoy adventuring in new places as much as staying at home on his farm and spending his days quietly in his cabin in the woods. Critics may find fault with some of Mr. Burroughs essays from a purely scientific standpoint. He is not to be rated with men of science, but he stands high as a literary naturalist. Walk with him if you want to hunt wake-robins or look for spring warblers. His vegetables are always fresh and his fruit ripened in the sun.

In addition to the place where Slabsides was located, he had his home nearby known as Riverby, a stone house built on a hillside and with a little study on down the hill. His vineyard was nearby, and his son Julian Burroughs lived near. He shipped his grapes to the New York market, but along with the grapes he was producing essays just as honest in weight and wholesome in flavor. All of these thoughts ran through my mind as we sat there before the crackling fire talking quietly and growing drowsy in the cozy warmth.

That night I slept in a rustic bed under the covers that Mr. Burroughs' mother made some eighty years ago. He was very proud of them, as he well might be.

After breakfast the next morning he had a letter to write, so I picked up his volume on Whitman and sat by the fire reading the part of his preliminary chapter where he told of buying this place. "I call this place Whitman Land, because in many ways it is typical of my poet—an amphitheater of precipitous rock, slightly veiled with a delicate growth of verdure, enclosing a few acres of prairie-like land, once the site of an ancient lake, now a garden of unknown depth and fertility." His friend, Walt Whitman, had walked here through the woods with him and up Black Creek before Slabsides was built.

In the last days of his life, I saw him at Pasadena Glen in southern California and at the hospital in Pasadena. A month or so before this, he had fallen and bruised a place on his side. This resulted in an abscess and an operation, but the wound did not heal. Even at this time, before he started home on his last trip, I saw his eyes brighten at the mention of birds and flowers. Death came on his way home. He sleeps on a Catskill hillside beside a big rock where he played as a boy.

Little Jim

By E. H. Pease, Jr.

HE must have been a bad little porcupine and disobeyed his mother's instructions not to stray from home. I first saw him clinging to a branch of a bush no higher than three feet above the ground, and from which I easily shook him and found that he was no snail at covering ground with the gait that identified him as a porcupine. He immediately started to hobble towards a nearby clump of spruces. I turned him around with my high-topped boot, luckily of heavy leather for he showed signs of battle, and succeeded in sticking a goodly number of quills into my boot-top.

LITTLE JIM WAS SLEEPY
As soon as he found that no harm was meant, he tried to nap almost anywhere.

Evidently "Jimmie" was quite sleepy, because, finding I had no intention of harming him, he quieted down and spreading his hind legs out behind to get closer to the cool earth, he closed his eyes, and prepared for a nap. I managed to touch his nose, and stroke his head without any disastrous results. In fact, I actually succeeded in making him look contented, even going so far as to tickle his stomach.

As all the porcupines I had ever seen had been in spruce trees, I cut a branch to carry Jim home on. I got him on the branch, but as soon as I started to walk with him he would slide head first down the branch and drop to the ground. Next I tried carrying him by the front paws, but he didn't like that mode of travel.

Finally Little Jim flattened out right where he landed, and prepared to go to sleep again. I picked him up and put him under one arm, being careful to keep a piece of birch bark between his quills and me, and home we went. "Little Jim" was given a very cozy apartment in an old peach basket turned on its side, and he slept all the rest of the day in his new abode, quite happy while he could sleep.

Orb-Weavers of the Garden

By A. B. Champlain

WATCHING for their prey in the center of a radiating geometrical snare, we often find the garden spiders. The beauty of their vertical orb-webs and the large size of these strikingly-marked creatures always attract our attention during summer strolls. No one who has ever watched a garden spider at work on its "woven wheel" can help but admire the wonderful skill exhibited in its construction and the manner in which it is accomplished. The spinning organs or spinnerets, consisting of little tubes leading from glands in the abdomen of the spider, secrete the viscous fluid that hardens into silk on exposure to the air. Measuring carefully by its ruler—one of its own legs—each spoke or radius and each circular mesh of silk which interlaces them is placed with accuracy and dispatch, the whole forming a radiating framework of tough, silken threads, with the net itself between them, strong and elastic. An extra zigzag band of whitish silk is provided at the center for stabilization. These webs, built to resist the wind and weather and retain the struggling captives that "blunder in," often measure two feet in diameter. They are usually made upon herbaceous growth along country roadsides, and in the marshes and upon the grasses and weeds in the meadows and open places. In these habitats, where insects are busy, the spiders reap a rich harvest.

PHOTOGRAPH BY CORNELIA CLARKE

ARTISAN OF THE GARDEN AT WORK

She weaves a trap for unwary grasshoppers and other wandering insects, helping the gardener mightily.

During the late summer and autumn, the grasshoppers form a great portion of the garden spiders' diet. The methods of trapping and holding these victims are interesting to watch, especially if a large "hopper" happens to land in the web. The spider rushes out from its station to the point at which the struggling captive is vibrating the web. If the grasshopper is large enough to tear the net it is rolled over and over by the spider, with deft movement of its legs, and wound and bound with more silk until its struggles have ceased. When threatened by dangers or disturbed during its periods of watchful waiting, the spider quickly drops to the ground and feigns death. It spins a thread of silk as it drops and when the danger is over it returns to the web by means of this thread.

Adult females of the garden spider may grow to measure over an inch in length, and are beautifully marked with spots and bands of black and bright orange yellow, while the males — about one-fourth as large — cut poor figures beside their large and irascible better-halves, who, not infrequently, eat them. Garden spiders mature late in the summer and during the autumn we find the evidence of maternal instincts, the devoted care with which the weaving mothers make and fill their pear-shaped egg-sac. The mother spider dies soon after this labor is performed.

The brownish silken bags in which the egg masses are "tied up" are about the size of a hickory nut. Suspended among the branches of shrubs and on weeds, partially concealed by bunches of dried leaves, the egg-sac is fastened by many strong silken threads, so that the winds and storms of winter will not tear it loose. The eggs hatch soon after they are placed in their winter quarters, and the young spiders spend the cold months snugly housed in their silken bag, waiting for the magic touch of spring, which carries the message of the awakening world.

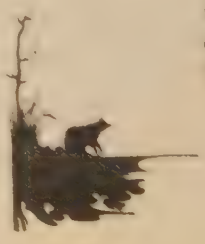
BARLESS BEAR CAGES AT FOREST PARK IN ST. LOUIS

Bruin enjoys surroundings that are close to Nature and is hemmed in by a moat on one side and cliffs on the others.

Barless Dens for Bears of St. Louis

By Frank Mason

THE bears in the Zoo at Forest Park in St. Louis know absolutely nothing about being "kept behind the bars" for the simple reason that there are no bars at all to their dens. At first glance, this is rather an alarming arrangement, from the standpoint of stray visitors, but it all works out very well because there is a deep moat of water between the guests of the Zoo and the bears on the far side, and the visitor is quite safe from the roaming urge of the bears.



Molds were made of the limestone cliffs along the Mississippi River, and plaster casts taken from these molds, which were then erected in place, and concrete shot up by means of a concrete gun. The effect is a natural one. Trees and shrubs grow freely between the divisions that seperate the different species, so that the casual visitor would never suspect the cliffs were not a part of the scenery. Altogether the effect is remarkable and adds immeasurably.

JACK AND JILL AT TEN WEEKS
They seriously mistrusted the camera and its companion, who took them from their log home.

Jack and Jill, the Vulture Twins

By Frank L. Yocom

PROBABLY this story of Jack and Jill, the Vulture Twins, would never have been written, if Betsy, Farmer Parsons' old brindle cow, had not refused to come up from the woods one night. But she wouldn't come, so Farmer Parsons had to go down after her. Climbing up on a large log to see over the briar patches, he finally located her, but in getting off the log he stepped on a rotten spot and his foot went through to its hollow heart. Slipping into a hollow log would surprise any of us, but when a large black bird, with no feathers on its head, ran from the end of the log and with a defiant hiss, sprang into the air and flew away into the dusk, —well, Farmer Parsons said, "I s'num."

His suspicions were aroused. He looked into the log through the hole that his foot had made and there on the bottom were two little creatures all covered with downy white feathers. Around them were broken bits of egg shell from which they had recently emerged. Thus it was that Jack and Jill, the Vulture Twins, were discovered in the place that was to be their home for more than one hundred days.

JILL AT HER FRONT DOOR
At the age of ten weeks she had a spread of wing that measured sixty-two inches.

Their growth was very remarkable. The first two weeks they grew from the size of the egg to almost twice that size. But there was one thing about them that would not change—their coats. Still downy and white they appeared in contrast with the dark of the parent birds which came to the nest to feed their offspring.

The first eight weeks of their lives they lived almost in seclusion. Only Farmer Parsons visited them, and he only occasionally. They grew larger and their wings began to expand. Here and there a few black dots began to appear among their feathers, indicating that soon their coats of down were to give way to dark brown feathers like those of their par-

plenty of light but sunshine is not necessary. If it is flowers you want, however, place your greenhouse where it will get some sun each day, but not too much.

And now comes the important thing without which your conservatory would fail. You must have a piece of glass cut the exact size of the base of your aquarium. Lay this over the top so that your plants are enclosed in a glass box. Sprinkle them with water before putting on the lid, and after that they will take care of themselves, since moisture is constantly condensing on the inside of the glass. The reason for this is that the plants are giving out moisture all the time and it is simply kept from evaporating by the air-tight container. The plants flourish in the damp air they cannot get in our houses. So the secret is in that top piece of glass.

Plant cases of this kind were first displayed at the World's Fair in 1851 by a man named Ward, and were called "Wardian cases." After that no drawing room was considered "tasteful" without one, and they really are pretty. Why should they not become popular again?

The California Condor

By Doris M. Cochran

LAST summer I had occasion to observe rather closely the cage of California condors at the Washington Zoo. These huge birds prove the most interesting of captives. Their antics are innumerable, and they apparently get as much entertainment out of watching the passing visitors as the visitors can possibly get out of seeing the condors.

The birds spent a great deal of their time on the tall perches provided for them, but they were not motionless, for the beady red eye of the uppermost bird would be frequently cocked to survey the activities of those perching lower down, which spread their wings sometimes and went through all manner of ruffling of feathers and hopping up and down on the perches.

PHOTOGRAPH FINLEY AND BOHLMAN

THE CONDOR IS A SPECTACULAR BIRD
Nature seems to have experimented in colors in fashioning for him a complexion that will wash.

The California condor is a spectacular bird, and it may be truly said of him, "Once seen, never forgotten." His head and neck are quite devoid of feathers, but the skin is colored a dozen different hues, as though Nature had experimented with all her cosmetics in order to give the bird's complexion the hues of a rainbow. The head itself is a brilliant orange, with a subtle play of lighter yellow and darker fire-color. The throat changes from orange to a beautiful lavender, which in turn becomes jade green on the sides and nape of the neck. At the base of the neck above the gullet is a huge diamond-shaped vermilion patch, which seems to swell and diminish alternately as the bird moves the muscles of its supple neck. This vermilion patch is the more set off by the ruff of stiff black feathers which come up around the base of the bird's throat like the ostrich feather boas which are sometimes so effective on pretty maidens. Perhaps the bird knows that they are attractive, for he sometimes makes them bristle out to their full width by flexing the skin beneath. The rest of his feathers are jet black, with the exception of a few that line the under side of the wing near the body and in front, which are of a pure and brilliant whiteness. The bird looks truly tremendous in size with the wings spread and these startling patches of white revealed. The feet are gray and scaly, with the flat toes of a turkey, telling us that the condor is not a bird of prey like the eagle, which needs long bent claws to seize living animals for food.

The bird's bill is high and prominent, though not very wide. It is very strong, however, and is used effectively when the bird tears his food into mouthfuls at feeding time. The condor eats only carrion. He stands on top of the meat, seizes an end of it with his bill, straightens his legs and neck, and then pulls with all his might, and the piece of meat usually vanishes down his throat as soon as it is torn away from the remaining chunk. Towards visitors, the condor is more than generous in his hospitable desire to share what he himself enjoys. More than once, as I approached his cage in mid-afternoon when the feeding had been done, the condor would seize the remnants of his feast—perhaps the skin and dangling legs of a dead rabbit—and trot up to the wire netting as near to me as he could get, and lay down his offering on the ground by the wire, as if to welcome me to share his little all. Should I not appreciate his motive, even though I must decline his offering?

SOME INTERESTING NATURE FOR JUNE

By E. Laurence Palmer

PHOTOGRAPH CORNELIA CLARKE

IN JUNE YOU WILL SEE DRAGON FLIES
There are few insects more interesting. Here one has just shed its case for a winged existence.

JUNE is not a month so generously peppered with birthdays of individuals famous enough to cause holidays in their honor as are many other months. It is a month, however, when a vast host of Nature lovers of school age desert their books and go to the open for first hand experiences. I have just been reading the classic Mother Hubbard to a four-year-old boy and wondered why Mother Nature and her cupboard full of interesting things shouldn't be just as interestingly presented as the story about the dog who had to go without a bone. I can't help but feel that many children who have gone to their teachers for Mother Nature's secrets have found a program as bare of first hand experiences as was Mother Hubbard's cupboard of bones. We might put the situation somewhat as follows:

Old Mother Nature went to the teacher to get a poor boy some help,
When she got there the program was bare,
So the boy had to just help himself.

In June, certainly, we find many boys helping themselves to valuable Nature experiences which they could not get in their school program. Frequently, even Nature teachers can't keep up with the youngsters and so try to steer them off into other channels, not realizing the unique value which lies in learning from the immediate environment. I once listened to a Nature leader talk to a group of children out of doors for a half hour about something miles away while meadowlarks sang throughout the performance unnoticed, and gulls, young and old, fed within fifty feet of the group equally unnoticed. The lesson given was good for its type but I felt that some rare opportunities were being passed up. I don't feel that there are many children who, with the beginning of vacation, will not, if given the chance, begin to learn from Nature either through kites, parachutes, toads or some sort of pet. We might express this again in the terms of Mother Hubbard substituting for that worthy dame Mother Nature who again took the boy and,

She went to the brook to show him a trout,
And when she got there he was pulling one out,
She went to the spruce tree to get him some gum,
And when she got there he was just finding some.
She went to the garden to show him a worm,
And when she got there he was watching one squirm,

If any of you feel like it, you might like to put in a little time in June watching some youngster go to Mother Nature on his own and see if you can't write better couplets than those I have suggested above. This may be worth more to you than you think because we adults can learn much from children. Mrs. Comstock very aptly says that if anyone feels that he is growing old he should take the first child he finds, sit down with that child beside the nearest living thing and let that child show the adult something that he never saw before. Those who know Mrs. Comstock know that if this is her fountain of youth it has proven exceptionally efficient in her case. So, for a June suggestion for adults, let me suggest that you use the exuberance of the youngster turned loose from school to help you find something worth while from Nature.

In some parts of the country June is the month of mosquitoes and black flies. Black flies are little humped-back fellows that swarm over any exposed part of your person. They may draw blood when they bite but the bite is not nearly so painful at the time it is made as it may be the next day. The larvae of black flies are to be found attached to the bottom in the swiftest flowing water. This is generally later in the season and the larvae are often so abundant as to make the whole stream bottom

PHOTOGRAPH L. W. BROWNELL

CAN FROGS SQUINT THEIR EYES?
Do various forms of wild life have this ability as do we humans? Look and see.

look black. When these appear see if you can determine how these creatures are able to move about in such swift water. While a black fly is biting you, or while a mosquito is biting you, see if there is any truth in the statement that if you hold your breath it cannot pull loose and escape. Also see if you can detect any apparent expression of joy that a mosquito makes while taking a meal. This expression of course is not vocal. You, no doubt, will hear a mosquito hum during the month and if you are lucky enough to catch it before it gets you, determine, if the remains permit, whether or not you captured a male or female individual. The male has finely branched antennae which look like feathers while the female's antennae do not appear to be feathered. Do the males ever bite you or ever molest you with their "music"?

PHOTOGRAPH LOUIS H. TOLHURST

WATCH THE MOSQUITO AS IT BITES
See whether you can detect any expression of joy as the insect takes its meal.

In June, you may also see dragon flies of various kinds foraging for their living. There are few insects more interesting and attractive than dragon flies and their close relatives, the damsel flies. Damsel flies are generally smaller than dragon flies and fold their wings over their backs when at rest while dragon flies keep the wings spread. Of course, this different wing arrangement produces variation in flight as well. I have seen dragon flies feeding over corn fields on warm June days in the Middle West great distances from any bodies of water. Do you find damsel flies as far from water as you do dragon flies? You will no doubt get considerable pleasure watching dragon flies feed. They remind you somewhat of hawks in the way that they pounce on their prey. If there is a gentle breeze do you find a group of feeding dragon flies headed into the wind or don't you find them feeding except on very quiet days? June is a month of weddings and you may see dragon flies or damsel flies mating during the month. Generally the male grasps the female in the neck region with the tip of his abdomen and the two may fly about tandem for some time. When you find a mated pair do you notice that the male is more brilliantly or less brilliantly colored than the female or is there little color difference? Neither dragon flies nor damsel flies can hurt you in any way so you may handle them in perfect safety.

PHOTOGRAPH A. B. KLUGH

WHAT ARE THE BIRDS DOING IN JUNE?
Always interesting, the Nature lover will find their activities specially so this month.

June has the longest days and shortest nights of the year and if you don't already know what day this is keep tab on the time the sun sets and see on what day it sets the latest. You may not be able to get this accurately but you will be able to find a few days that are close to the desired date. This year June will also be interesting to us in that it will offer us on the night of June 14th and the morning of June 15th a total eclipse of the moon. This will reach the height of totality about midnight, the time of course varying with the locality. Some of you may wish to try to take pictures of the eclipse when it is partly on. All this is so remember that the moon will be moving and that the shorter the exposure you can give and get enough light to make a picture the better will be your result, unless you can move your camera to compensate for the movement of the moon. This you cannot do probably without elaborate apparatus. If you have luck and a clear night you might be able to see pictures of the eclipsed moon on the sidewalk where it shines through leaves, the opening in the leaves acting like a pin-hole camera. Does the shadow on the moon approach from the moon's east side or from some other direction and if so what direction?

Peculiar shadows on the moon are not the only shadows to be seen in June, of course. If you watch your friends' faces you may begin to see, in some of them at least, little untanned creases where the sun has not penetrated, due to eyes that have squinted because of strong sunlight. Haircuts also frequently expose untanned skin and blisters and tans are always interesting subjects of Nature study. I once knew a bunch of boys who tanned their initials on their arms

by putting adhesive tape initials there and then after tanning themselves removing the tape. This left the initials in white. But you can look outside of human experience and find plenty of interesting things.

We squint our eyes to avoid intense sunlight and we unconsciously contract the pupils of our eyes for the same purpose. It will interest you to see how other forms of life adjust their organs of sight to light. Which of these creatures can and which cannot squint their eyes —fish, snakes, turtles, cows, dogs, cats, lizards, frogs, salamanders, grasshoppers, chickens and others? Snakes, turtles and lazards are reptiles. Can you safely say that all reptiles are alike in being able to squint their eyes?

As suggested above, we also modify the size of our pupils of our eyes to adjust them to varying light. Can all the creatures mentioned above do this? If any of the creatures mentioned can modify the size of the pupils is this always done in the same manner, that is, is the resultant reduced pupil essentially the same shape as the expanded pupil as is the case with ourselves? Are there any creatures that are remarkably slow or any that are remarkably fast in making this adjustment? Is it safe to say that all snakes are alike in the shape of eye pupils?

It was suggested that we humans can change our color by tanning ourselves and by getting hair-cuts. There are no doubt other methods which are used but it might be just as well not to mention them. You will notice, however, that many birds change their colors remarkably during the month of June. A red-winged blackbird for example, looks different at the end of the month from what he did at the beginning. This in a way is not unlike the way many people change the color of their hair. In the case of the blackbird, the red tip of the feather wears off leaving the darker base exposed. If you look long enough and closely enough you find plenty of people whose hair at the base is differently colored from that at the tip but whether this is natural history or not is not for me to say. The means by which all sorts of creatures change color is worthy of observation whether you ride in the crowded trolley cars or go into the open uncrowded fields.

It may be worth our while to keep this color variation in mind through a number of months and find what are the determining factors. Is it sex, age or type of work done or is it something else? I shall ask you something more about this another month.

Let me go back in closing to the Mother Hubbard and Mother Nature introduction I made in this article. We all know how Uncle Sam looks with his beaver hat and long-tailed coat. We all know the attire of Mother Goose and the lack of it in Cupid. We know of the scythe that Death carries and the hour glass of Father Time. Are there any artist readers of this section of Nature Magazine who know how Mother Nature looks and would care to send in a picture of her? She is in her glory in June. Should we try to standardize her as we have Cupid and the rest or should we leave her to the mind's eye of each individual? Possibly some of you who can't draw might like to write your ideas on this. Whatever your talent may be, though, don't forget to know Mother Nature better this June.

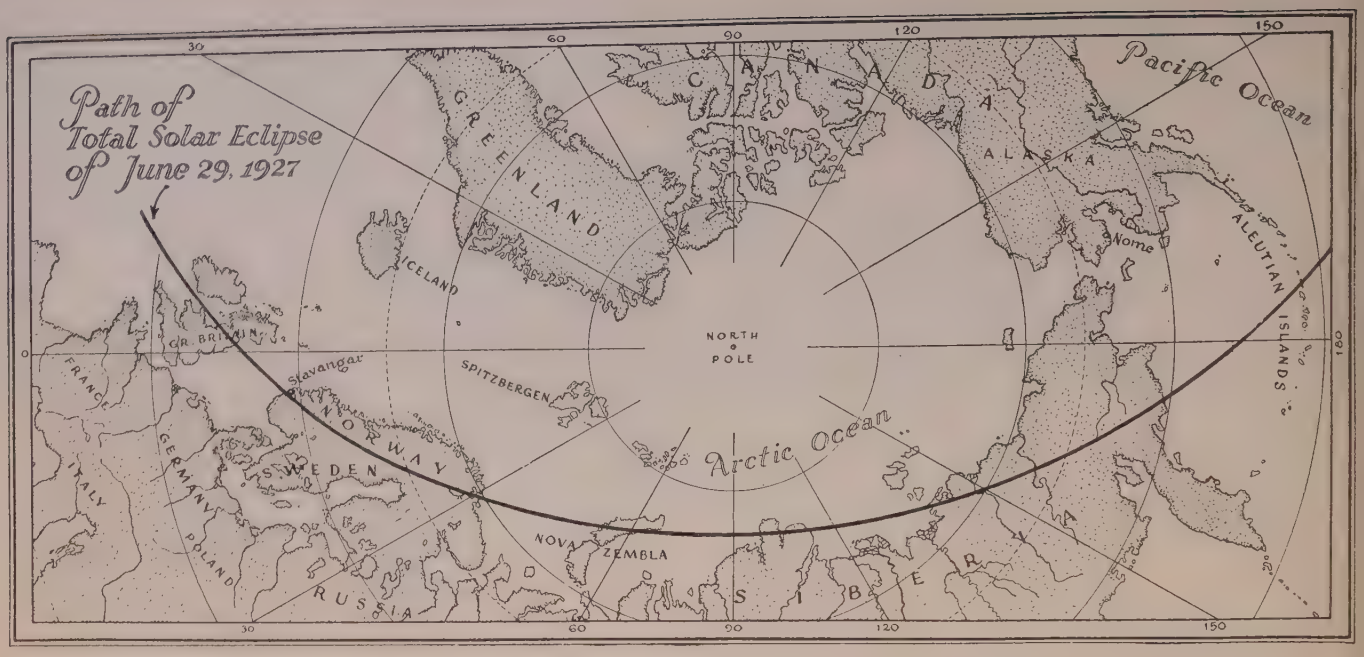
Not a Horn-Snake After All!

By A. L. Pickens

SOME years since, the editor of a Carolina mountain-county weekly sought assiduously for proof of the existence of the horn-snake which, in popular myth, is supposed to go about stinging trees to death, and now and then destroying a man. When this odd-looking reptile was found not far away, an old mountaineer unhesitatingly pronounced it a horn-snake, declaring he had seen one before. Both the editor and the mountaineer were wrong. Some one else pronounced it a joint-snake, the kind that is supposed to fly apart when struck with a stick, each part being one of the joints in the snake's body! The head is further supposed to go about joining up all the sundered joints, after which the reptile crawls off as good as new!

GLASS SNAKE AGAIN
The story of this legless lizard was told in a recent issue of Nature Magazine and here is more evidence.

Of course the well-informed Nature lover recognizes in this animal not a snake at all but one of the limbless lizards, usually called misleadingly, a glass snake. Like other lizards, it sometimes sheds the tail when in danger, and then calmly sets about growing a new one as here shown. The severed member it leaves behind with as much neglect as does any lizard and about the only thing left for the sensation-lover to exclaim over is the assured fact that here we have a lizard without any limbs whatever.



On June 15 the moon will be in total eclipse visible all over the United States. It will first dip into the shadow of the earth at 1:43 A. M., Eastern Standard Time. The total eclipse will begin at 3:14 A. M. on the 15th. Central Time, Mountain Time and Pacific Time will record the events one, two and three hours earlier, respectively.

"BIG DOINGS" in the JUNE SKIES

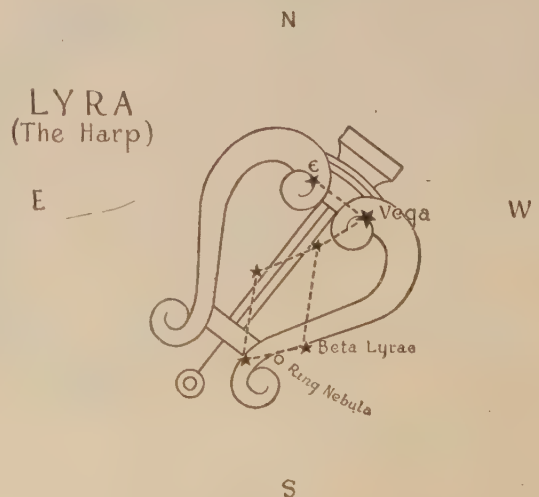
By Isabel M. Lewis

In its eclipse on June 29 the sun will be more exclusive than the moon so far as its audience is concerned. Eclipses of the sun are restricted to a narrow belt and the event in which the sun takes part this month will be visible in the sections shown on the above map. Alaska will be able to see the big solar event as a partial eclipse.

BOTH the sun and the moon have selected the month of June to go into temporary retirement. The moon will perform for the special benefit of the inhabitants of practically all of the North and South American countries and keep many of us up until the early hours of the morning to witness the interesting event. To see the total eclipse of the sun, however, we would have to travel considerable distances as the map above shows.

A total eclipse of the moon is not so rare an event in any one locality as a total eclipse of the sun, since the moon is visible from half of the earth's surface when in the earth's shadow. A total solar eclipse is only visible within a narrow strip of the earth's surface, usually less than one hundred miles wide and about five thousand miles long, over which the moon's shadow sweeps. A total eclipse of the moon may last for more than an hour while a total eclipse of the sun may never last for more than a very few minutes, less than eight at the utmost. A total eclipse of the moon is not of so great scientific value as a total eclipse of the sun, which astronomers often travel thousands of miles to observe. Yet no one should miss an opportunity to observe the impressive phenomenon affecting the moon which illustrates how unfailing and exact are the laws of Nature, and how man can predict these events almost to the moment of their occurrence.

The total eclipse of the sun which will take place on June 29 is not visible in this country, except in Alaska as a partial eclipse, but it is being awaited with great interest in England and Scandinavia, over which countries the moon's shadow will sweep early in the morning. As there has been no total eclipse of the sun visible in any part of England since the year 1724, and none will occur there in the future before the year 1999, it is not strange that England is taking an exceptional interest in the coming eclipse. The duration of totality, however, is less than a single minute at the most, and in northern Wales and England will be less than thirty seconds. It will occur there about 5:25 a. m. with the sun only a few degrees above the horizon. Most astronomers are, therefore, planning to observe the eclipse in Norway or Sweden where the duration of total eclipse will



THE CONSTELLATION FOR JUNE
This is one of the smallest yet one of the finest star groups.

range from thirty to forty-five seconds and where the eclipse will occur a little later in the morning with the sun a few degrees higher. After leaving the northern coast of Norway the path of total eclipse will pass over the Arctic Ocean to northeastern Siberia and will then cross the Bering Sea to the Aleutian Islands leaving the earth at sunset in the Pacific Ocean near the coast of Alaska. There will be a partial eclipse of the sun in Alaska, the magnitude of the eclipse being eighty-six per cent at Nome. Partial phases of this eclipse will also be visible over all of Europe and northern Africa, northern Asia and the Arctic regions. The eclipse will be total at Liverpool while at London ninety-six per cent of the sun's diameter will be covered by the moon at greatest eclipse.

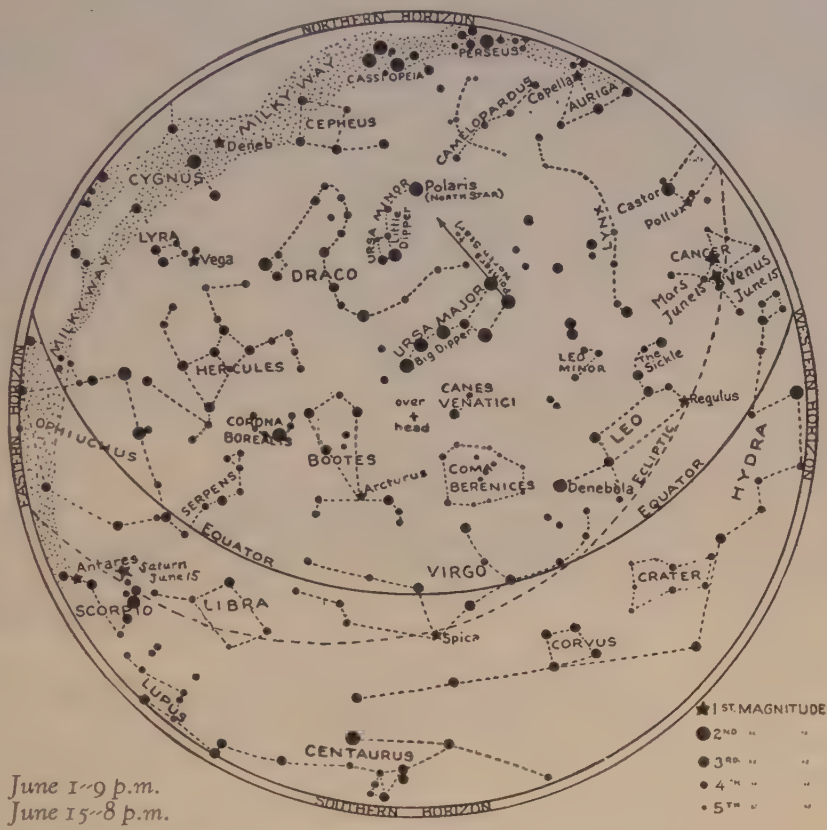
There will be at least one expedition from the United States in the path of totality, the McCormick-Chaloner Expedition of the Leander McCormick Observatory of the University of Virginia, which will be in charge of Prof. S. A. Mitchell, Director of the Observatory. This expedition is financed by Mr. J. A. Chaloner of Virginia and it will be located at Fagernes in Norway. Although the total eclipse will last only thirty-four seconds there it is expected that some very valuable observations may be made in these few fleeting moments.

Among other interesting astronomical events this month will be the approach of the small Pons-Winnecke Comet within three and a half million miles of the earth on June 26. Few comets ever come this close to the earth. It is possible that the earth may pass through the tail of the comet but nothing more than a possible shower of meteors is to be expected and the comet itself will probably not even be visible to the naked eye as it is a very inconspicuous little object, a member of Jupiter's family of comets, that returns periodically to pay its respects to the sun every six years.

Venus is now a magnificent evening star. It is increasing in brightness and sets more than three hours after the sun. On June 9 it will be in conjunction with Mars which passes through Cancer this month and is now no brighter than the North Star.

Saturn is in Scorpio a little to the northwest of Antares and is nearly as brilliant as Vega. Jupiter is now in Pisces and a fine morning star. On June 24 it will be on the meridian at sunrise. Mercury reaches its greatest distance east of the sun on June 22 and for about a week before and after that date may be found in the evening twilight a few degrees north of west and not far above the horizon.

The sun will reach its greatest distance north of the equator on June 22 at 5:22 a. m. (E. S. T.) Summer will then begin and this will be the longest day of the year in the northern hemisphere.



June 1—9 p.m.
June 15—8 p.m.

TO USE, HOLD OVER HEAD WITH TOP TOWARD NORTH

One of the smallest and yet one of the finest star-groups in the June skies is Lyra, The Harp, now to be seen in the eastern sky in the early evening directly to the east of Hercules and west of the Northern Cross in Cygnus.

Within the limits of this small constellation are to be found some of the most interesting objects in the sky. Vega, one of the twenty brightest stars and a rather near stellar neighbor, since it is only about forty light years, or 240,000,000,000,000 miles away, has often been called the "arc light of the sky" because of its intense, bluish-white light. It is considered to be one of the finest stars of the northern hemisphere equal in brightness to Capella and Arcturus and surpassed only by Sirius and Canopus. The name Vega or Wega, as it is sometimes written, is Arabic and means "Falling Eagle."

A little to the northeast of Vega is the famous quadruple star, Epsilon Lyrae, which even the smallest telescopes will split up into a wide pair of stars, each one of which is in turn a close double star, making in all four stars which appear to the naked eye as a single star.

Epsilon Lyrae is a rather faint star of the fourth magnitude and it forms with Vega and with another star about equal to itself in brightness a little equilateral triangle by means of which one may always identify Vega.

Another interesting star in Lyra is Beta Lyrae, some distance to the south of Vega, which has a companion star revolving around it in such a way that there is an eclipse of one star by the other twice in each revolution. This causes a periodic variation in the brightness of this star. There are many stars of this kind in the heavens and they are known as eclipsing variable stars.

Lyra also contains the beautiful Ring Nebula, which consists of a nebulous ring of light surrounding a cen-

tral star. Although this nebula is one of the few of its kind that can be seen in a small telescope it needs a very powerful telescope aided by photography to show all of its beauty in detail. Some very fine photographs of this odd object have been taken with the great 100-inch reflector of the Mt. Wilson Observatory in California.

There is an interesting legend which tells how Arion, a noted musician of the court of Periander, king of Corinth, was at one time returning from a musical contest in Sicily with a valuable prize. The sailors, who coveted this treasure, seized him and were about to throw him overboard when he begged to be permitted to play for the last time on his harp. Lured by the sweet music dolphins surrounded the ship, and as he jumped into the sea one of them took him upon its back and carried him safely to shore. Now both the harp and the dolphin may be seen in the heavens as Lyra and Delphinus. The latter constellation lies some distance to the southeast of Lyra and is a small diamond-shaped group.

Cow-Poison

By S. S. Dickey

THERE are few growing things in all the April woods more attractive than that member of the lily family, the American white hellebore, more generally known to farmers as "cow-poison" because its roots disagree violently with their herds. The wanderer, meeting this plant with its broad, crinkled leaves and conspicuous veins some showery April day, finds it a thing of beauty. The droplets of water cling like diamonds amid the folds of the light green leaves.

Cow-poison seems to flourish to best advantage in the northern states, amid bogs and swales; but on the table-lands of the mountains it extends far southwards into West Virginia's virgin wilds. There on the summit of Spruce Knob, nearly five thousand feet above sea level, it grows beneath the sheltering red spruce canopies.

The hellebore is destined to lose its fair green appearance as summer days arrive, and the adult plants reveal many a dingy, half-withered leaf. This may be the reason why this plant was given the name, *Veratrum viride*, by the botanists who first described it, because the term indicates blackening leaves.

Although cow-poison may be odious enough to the farmer, it is a fact that it holds a spot in the heart of the forest wanderer. Around its mystic enchantments swirl memories of distant bogs, where the black spruce and the blasam fir stand in park-like vistas; where one wanders amid Nature's many charms.

A Nature Puzzle

By Florence H. Moore

THE circus was on its way to the next town, when one of the animals escaped. It was gone several days, with little food and water, but that was a mere incident in its adventurous life. It can go for a week or more, travelling over hot, desert sands, without water, for it has seven cells in its stomach, which it fills with water and from which it can draw whenever it is thirsty. This tides it over long, dry spells without any stop in the journey or discomfort to itself.

Zoologically speaking, it is a tylopodous, (*now* you *will* have to consult the dictionary) of the genus Camelus. This particular kind is a Bactrian, or two ——, we almost told you that time, while another species is a one ——; but we musn't tell you any more, for you wouldn't have the fun of finding out for yourself.

The letters of its name are also in the picture. Write them down, then assemble in order.

Answer to May Puzzle
GIRAFFE

LAND CHEWED AWAY BY THE UNLEASHED WATERS
Hundreds of thousands of acres along the Mississippi, Ohio and Missouri river bottoms have been transformed into scenes such as this one.

Forests—Anchors of the Hills

By Hugh Hammond Bennett
Bureau of Soils, U. S. Department of Agriculture

WE have been in the habit of turning to other countries for examples of lands, denuded of their timber, their soil washed away by the unleashed waters. We are urged to look at the bleak wastes found over vast areas of China and Asia Minor and to see them as the kind of heritage America will surely pass on to future generations unless she speedily changes her practices of cutting timber from steeply-sloping areas and of permitting needless fires to destroy soil-binding vegetation. But we do not have to look afar. In this youthful country of ours we have only too many examples of what happens when land is unwisely used.

In a single county of the Piedmont region a soil survey revealed more than ninety thousand acres of formerly productive soil fallen to the low estate of "rough gullied land." Its soil had washed away; in thousands of places the underlying rock had been exposed, and only unimportant patches of unscarred land remained as islands and peninsulas between hideous gullies, most of which are not large enough to cultivate. Not far away, sixty thousand acres, formerly cultivated as good farm land, have been similarly destroyed or impaired beyond possibility of economical use for anything but forestry. Most of these ravaged areas are permanently destroyed so far as crops go. Centuries would be required for natural restoration of a new layer of even mediocre soil. What a prospect with gullies more than two hundred feet deep where a short while ago cotton and corn were growing! Forty years ago a school house stood on a spot from which the eye now sweeps a thousand acres of destroyed land.

In the strip of loessial soil extending along the east side of the Mississippi River from Louisiana northward into Kentucky, and thence up the Ohio and Missouri Rivers, hundreds of thousands of acres of land have been ruined since the removal of the timber a few generations ago. In one locality several counties have now only scattered tracts of really good soil.

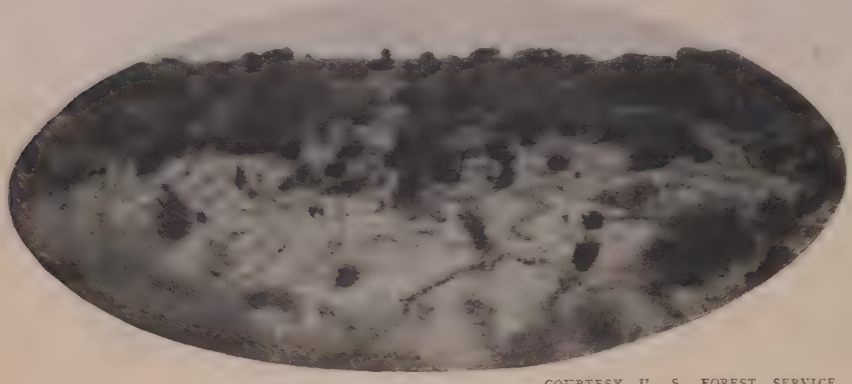
Many cut-over slopes in the Appalachian Mountains are now grim spectacles, monuments to man's wasteful methods. The virgin for-

TWO hundred million dollars a year washed away! One hundred and twenty-six billion pounds of plant food wasted annually!

This is the story that Mr. Bennett tells in this article. He sets forth the facts of a problem that demands nation-wide activity. Today the issue is being met in a meagre way. Thousands of farmers are trying to eke out existence on poverty-stricken soil that is gripped by the force of erosion. Little help can be given them because funds and specialists are needed to learn what best can be done.

Mr. Bennett's story presents an important problem in conservation. May we hope that it will arouse an appreciation of the issue sufficiently great to further the need of quick and adequate action to meet the challenge of erosion.

ests, instead of being carefully cut according to the sane methods of forestry, were cut down with ruthless waste, and the land burned over and plowed for crops. After a few years of corn or tobacco the fertile soil has washed away in vast sheets, and in a thousand gullies both soil and subsoil have been eroded to bed rock. Magnificent forests that should have given perpetual cuttings of valuable timber have disappeared almost at a single stroke, and ridges between unsightly gullies now riddle the land-



COURTESY U. S. FOREST SERVICE.

WINNING BACK THE WATER-RACKED SOIL
Young trees beginning to reclaim severely-eroded area in California.

scape like the bleached bones on desert sands.

Wastage by erosion is not restricted to the uplands. Millions of acres of formerly productive alluvial land along streams have been seriously impaired or ruined by the deposition of inert sand and gravel. Channel-ways have been choked to overflowing by sediments washed from bare slopes that never should have been cleared. Not only this, but the reservoirs of costly water-power projects are silting up at a rapid rate, so that the power generated must depend more and more upon stream flow, without much assistance from water stored for time of drought.

In various parts of the country streams that formerly were navigable have become so choked with sediment that their channels have become obliterated or split into several channels too shallow and small to carry the increased floods from the cleared uplands. The Coldwater River of Mississippi, for example, was regularly ascended about forty years ago by boats of large size. These boats loaded cotton at the town of Coldwater. Now mudflats and sandbars keep river boats from this stream. A large, productive cotton plantation just below Coldwater has been abandoned, and the fields are grown over with thickets of willow and cottonwood.

In our farming operations we have made use of lands too steep for cultivation, with little or no regard for what would happen to the soil under the influence of beating rain storms. Some well-known types of soil, such as the Cecil clay loam of the Piedmont, the Memphis silt loams of the Missouri and lower Mississippi Valleys, and the Cincinnati silt loam of the belt of hills bordering the Ohio River, are so susceptible to erosion that these lands gully or even melt away like sugar when, on slopes of only moderate steepness, they are used for the intertilled crops. Notwithstanding this common knowledge, practically all of these lands have been cleared and put into cultivation, with no terraces to protect them from erosion, except in the southern Piedmont section. As a result thousands of farms have been cut to pieces by gullies, and have been shorn of the fertile topsoil by sheet erosion.

In the central part of the Appalachian system a survey showed that fifty per cent of all the cleared land had been seriously damaged by erosion. In some fields where the stumps of the removed forest had not completely disappeared the surface soil had been washed off and "poverty grass" was driving out the more valuable blue-grass. On the steeper slopes of the older fields, now abandoned, practically all of the soil had been removed down to bed rock, even where the virgin soil averaged nearly eighteen inches in depth, as a few remaining patches of the original timber showed it once had.

COURTESY U. S. BUR. PUBLIC ROADS.

GRAVEYARD OF A RICH FIELD
Rich bottom land buried twenty feet deep under sand washed from uplands.

In the wake of such devastation there are to be seen a large number of small farms worn out by erosion and abandoned when there was no more virgin land to clear.

A conservative estimate of the area of land formerly cultivated in the United States and now permanently destroyed for farming purposes by erosion is not less than thirteen million acres. But this destroyed area does not represent the worst features of erosion.

The slower type of land wastage known as sheet ero-

sion is the real evil genius. By this process every rain heavy enough to cause water to flow takes its toll of soil, and takes it from the top, the richest part of the field. Rain water does not run away from cutivated hillsides as crystal-clear liquid, but rather as a turbid mixture of soil and water. In this manner it is estimated that each year not less than 126,000,000,000 pounds of plant-food material, washed from cultivated fields and pastures, are carried into the sea or deposited upon slopes and over valley bottoms where it is not needed. Our agriculturists have devoted a vast amount of work to the problem of replenishing the plant food removed from the soil by cropping, and have given but little attention to the far more serious problem of erosion. Certainly erosion removes from our fields more than twenty times as much plant-food material as is lost in crop production, and little is being done to solve the problem. Furthermore, the crops take the elements of plant food, something which can be restored; but erosion takes the whole soil, which can not be restored.

PHOTOGRAPH U. S. FOREST SERVICE.

WHAT HAPPENS ON THE STEEP SLOPES

When timber is cut from land like this it is not long before the soil is washed down to rock.

Annually our farmers are losing at least $200,000,000 by erosion. The actual loss to the Nation is far greater than this; it is incalculable. As a soil is worn down it becomes less productive, not at a uniform rate, but at a progressively increasing rate. After the removal of the forest mold, the mellow topsoil goes, exposing raw subsoil, usually clay which is less fertile and more difficult to till. After this comes the bed rock on which neither trees nor tilled-crops can be grown.

COURTESY U. S. BUR. PUBLIC ROADS.

AN AGRICULTURAL NO-MAN'S LAND

The fence has been moved back as the menacing gullies advanced until they now eat beneath the barn.

Erosion probably modifies the character of the earth's surface more than any other natural force. Volcanoes, earthquakes, tidal waves and tornadoes modify the earth but little in comparison. Over the United States erosion in one day moves soil material exceeding the weight of all the car loadings and all the freight entering and leaving the ports of North America for a period of twelve months.

The problem is the biggest one confronting the farmers of the rolling areas of the country. In the field of conservation it is more important than the problems effecting all other natural phenomena. If the land is conserved many other essentials could be replaced by the products of a fecund soil. When our petroleum is gone, for example, alcohol for fuel can still be made from sugar cane, potatoes, cassava and many other soil-grown products.

We are doing very little to counteract the evil of soil erosion but much to accentuate it. We have not yet determined for our extensive soil types at what degree of slope farming should cease and the growing of timber should begin. In general, slopes of more than about twelve or fifteen per cent declivity should be used only for grass or trees. A number of types, such as the extensive Susquehanna clay of the Gulf coastal plain, are so susceptible to erosion on all sloping areas, no matter how gently sloping, they should *never* be cleared of timber. On the other hand, a few soils of high capacity for absorbing water can be safely plowed on slopes as steep as twenty or twenty-five per cent. Land of the latter type is far more extensive in the tropics than in the temperate zone. In the United States we may generally class all

land that slopes as much as twenty-five feet in one hundred feet as forest and grazing land. Even deep, open sand was found to be severely gullied on steeply sloping cotton fields of East Texas.

Usually land with less than fifteen inches of soil over rock should never be cleared if there is any slope at all, as it will almost surely wash away, regardless of terracing or other obstructions that may be provided for protection against erosion. If this general rule had been applied in the mountainous areas of the country, several million acres now ruined or severely impoverished might be clothed with forests of far greater value than all the crops that have been grown or ever will be grown on the cleared areas.

COURTESY U. S. BUR. PUBLIC ROADS

WHERE EROSION HAS DONE ITS WILL

Forty years ago this was cultivated land but today the gullies are a hundred feet deep.

Although terracing has been practiced in Southeastern United States for more than half a century, and has saved thousands of farms, even in sections where erosion is exceptionally severe, this best of all known artificial methods of protecting cultivated fields has only recently extended as far west as Central Texas. It is almost never practiced north of the southern parts of Virginia and Tennessee, nor west of the Mississippi River, save in Texas. Nevertheless, probably ninety per cent of all the cultivated land of the Nation having a slope greater than three feet in a hundred should be terraced wherever there is enough rainfall to cause surface run. The terraces serve not only to hold the soil, but to store winter and spring rain for the use of crops in dry summers.

There is immediate need for a great deal of fundamental data relating to erosion, not only for farm lands but for grazing and forest lands. There is need of knowledge as to the type of terrace best suited for the protection of soils of varying resistance to washing there is need of information as to the cause and means of preventing gullying in certain forested areas of southwest Virginia and other regions; more knowledge relating to the number of cattle or sheep that can be carried on grazing lands of different types before ruinous erosion sets in is greatly needed; and much other imperative information in this field of investigations that should have been available long ago still remains to be ascertained.

There is urgent necessity for a national awakening to the importance of combatting the destructiveness of this sinister form of land wastage. Reforestation is one of the synonyms of soil conservation, and, accordingly, public-spirited men and women in all walks of life should give support to those engaged in worthy efforts of forest protection and reforestation on the watersheds and on all those types of soil which are unsafe for cultivation or even for pastoral use by reason of steep slope, shallow soil or other deficiency.

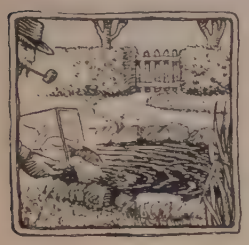
AN IMPORTANT CHANGE

EFFECTIVE with the July issue, Nature Magazine will be published on the presses of the Conde Nast Company at Greenwich, Connecticut. These publishers, known for the beautifully printed magazines, Vogue, Vanity Fair and House and Garden, are equipped to give to the material which goes to make up Nature Magazine the highest quality of printing. This change is being made in accordance with the desire of the Directors to give the members of the American Nature Association as attractive magazine physically as the Editorial Board has sought to give them editorially.

HINTS and HELPS for HOME and GARDEN

June

JUNE is here and the moths are already busy. Try sprinkling a few flakes of Dichloricide in the folds of the heavy clothes which you are putting away. These flakes do not harm or stain materials in any way, and the gas which they generate not only is deadly to the moths but it disappears within an hour when exposed to the fresh air. You will have none of the unpleasant lingering odor of camphor.



Watch your bird baths to see if any tiny mosquito wigglers appear in the water. They are only about an eighth of an inch long, but they wiggle to the surface very often for a breath of air. If you discover any, place a goldfish in the bath for an hour. You will be providing him with a real feast and he will exterminate the mosquitoes before they change into the winged form.

If you have a moist, shady spot in your garden which is unoccupied but is also well drained to prevent sourness of soil, put the house fern outdoors. It will thrive in the soft summer rains, but must be guarded against any severe drought.

When the weather becomes hot, mulch the sweet peas with grass clippings. Keep all the flowers cut so that the energy of the plant will not be wasted in forming seed pods. Cut the flowers in the early morning before the sun has dried them out, and immerse the stems in a deep bowl of water or even in a bathtub for an hour before arranging them in vases. You will find that they will last much longer. Every morning give them a change of water and clip off the tips of their stems.

Remove the side shoots of the tomatoes to make strong compact plants. Bordeaux Mixture applied every two weeks to the foliage will help to keep it free from insects.

It has been said that weeds are a blessing to the garden. If there were no weeds to remind one to cultivate the soil frequently, we would be all too ready to neglect a very important duty. Soil must be cultivated not only to prevent caking but also to conserve the moisture.

Any shrubs which should be kept compact in shape or dwarf in size should now be root pruned. To do this, force a spade to its own depth into the soil in a circle round the plant to cut off the small roots which are reaching out beyond the spread of the branches.

Liquid manure is an excellent fertilizer. Use it every two weeks on roses, pansies, dahlias, asters, mignonette, snapdragons, etc.

A knife will be found better for cutting the gladioli than scissors. Cut the flowers when only one or two blossoms are open, and be sure to leave about three or four leaves intact at the bottom so that the bulb may receive nourishment to store up for next year after the flower is gone.

In cutting flowers, always take long stems even if a few buds are sacrificed in so doing. This will supply the necessary pruning for the plant. Pansies must be picked in this way or the plants will grow too rank and sprawly in hot weather.

What do you do with the salt and melted ice from the ice cream freezer? Dump this on the driveway to discourage the growth of weeds and grass. Another suggested way to accomplish this result is to sprinkle with a solution of five pounds of blue vitriol to five gallons of water.

The foliage of Spiraea thurbergii makes a lovely greenery for the cut flower bouquet.

Aphids are now sucking the juices from the buds of roses and asters. When the dew is still on the buds in the morning, dust them with powdered tobacco which will stick to the moisture and effectually rid them of their burden.

Stop cutting the asparagus by the middle of June and let the plants go to seed. They must now have a chance to store up nourishment for next year's crop.

New shrubs and trees must be watered during every drought. The first and second seasons after transplating are the most dangerous. If you once begin to water the rest of the garden, you should keep it up regularly throughout all of the dry spell. Artificial watering causes the plant to depend upon moisture close to the surface. Shallow roots are thus developed and resistance to drought conditions is lowered.

Mrs. Mohler of San Diego, California, writes that a mixture of a pint of turpentine and one of liquid paraffin is excellent for polishing the furniture as well as the floor. Wash the surface first with tepid water and ivory soap, and then apply the polish.

Lock the barn before the horse is stolen. In other words, do not wait for a severe storm to remind you to tie up the dahlias, hollyhocks, delphiniums and other tall plants. Even a heavy wind plays havoc with the tall spires.

Shrubs that are through blooming should be pruned as desired, and all superfluous and dead wood removed. Do not prune the rhododendrons and laurel, but you may remove the dead blossoms to aid for the new growth.

Nursery Nature Tales

BEING THE ADVENTURES of TOBY & BETH
TWO VERY LITTLE PEOPLE IN THE BIG WORLD

Hungry Little Birds

by Elizabeth K. Peeples

TOBY lay on his stomach, kicking his heels in the air. His eyes and curls were the only dark spots in the sunshine of the porch. Before him was a sheet of paper, some water, paints, and a brush.

Beth trotted over and sat down close to him. "Make a picture of my canary," she begged.

"No," said Toby, "I'll make a picture, and you can guess what it is."

Then Toby painted a bird with a yellow bill, a brownish back, and a plump, red breast.

Beth clapped her hands. "It's our robin!"

Just then Mother came out with some milk and crackers.

"There goes our robin now," observed Beth as she munched her cracker.

"There it comes back again!" Toby pointing his finger. "Mother, why does the robin fly by so often? We saw them finish their nest."

"We saw blue eggs in it, too. I saw them out of the attic window," Beth insisted.

"Let's go up to the attic window again," said Mother.

"There are live things in the nest, but what are they?" Toby whispered as they peeped from the attic window.

"Those are little robins," Mother whispered back. "Robins? They can't be! They haven't any feathers! They haven't any eyes!"

"Very ugly," agreed Beth.

"Where are the father and mother robin?" Toby asked.

"They are bringing food to their little ones, as I just brought it to you," said Mother.

"Crackers and milk?" inquired Beth.

"Something the young robins like much better. Here comes the father robin with one in his bill."

"Earthworms!" almost shouted Toby.

"Ugh—squirmy," said fat little Beth.

"I've seen the robins getting them out of the lawn. First they listen this way." Toby cocked his curly head to one side. "Then they listen that way," and over went his head. "And then they pull up the worms!"

As the father robin lighted beside the nest every little robin stretched up a long neck, and opened a mouth that seemed larger than itself. In a flash the father bird had dropped the worm into a waiting throat and was off for another.

"They will soon open their eyes and grow feathers. Then you will see that they are really birds," said Mother.

"It's funny! Little chickens have feathers and can run around the very day they hatch out!" Toby seemed to be thinking aloud.

That night as Mother tucked in the children, Beth said sleepily, "what is the robin's bed made of?"

Toby was wide awake. "First they brought grass and little roots. Then they made a clay bowl in the nest. You remember how the mother robin pressed it smooth with her breast, Beth? Then they put in some more grass. That was the mattress."

"And now the little robins are so ugly! I wonder if their mother is sorry?" asked Beth doubtfully.

"She loves them. Both parents work all day long finding food, so they will grow to be beautiful big robins," answered Mother.

"What a good father and mother," said Toby. "Just like my Mother and Daddy," murmured Beth to her pillow.

NATURE EDUCATION

Prof. E. Laurence Palmer, Cornell University, Director

ASSOCIATES

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Mrs. Elizabeth K. Peeples, of the Washington, D. C., Schools.
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Miss Clelia Paroni, Supervisor of Nature Study, Berkeley, Calif.
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With June, many Nature Education activities will be transferred from schools to the open fields and camp sites. This change will result in new viewpoints, acquaintance with new physical surroundings and should produce new Nature interests. It offers a splendid opportunity for the formation of new hobbies. This summer it may be a hobby for prairie flowers, next summer, for rocks and minerals from mountains; another, for butterflies from some foreign land. Whatever it may be don't neglect or deprive yourself of the pleasure of riding not only a pony over your Nature trails but a hobby as well.

In a certain Kansas school the making of bird houses was a sort of hobby this spring. Instead of leaving the judging of the value of the houses to humans, birds will be the judges. The school is divided into two teams, each pupil of which has made and put up a bird house. The winning team will be the one the most of whose houses had been occupied by birds other than English sparrows.

A Botanical Contest, the object of which was to familiarize school children with shrubs and flowers grown in the city greenhouses was held recently in Dallas, Texas, under the joint auspices of the Park Board and the Dallas *Times Herald*. The contest was divided into two periods, one for study and one for examination. Fifty plants were selected and arranged in one of the greenhouses for the children to observe. A placard giving the name and stating the method of propagation was placed beside each plant, and allowed to remain during the entire study period, which lasted about a month. At the end of that time, the placards were removed and the plants rearranged and numbered. The contestants then attempted to identify the plants and tell the methods used in their culture. Zest was added to the contest when a local jeweler offered six wrist watches as prizes. Hundreds of children competed, and mothers, teachers and playground supervisors cooperated in helping the children with their preparation. The offering of material prizes should not, however, be necessary for successfully carrying on contests along similar lines.

This page for the next two months will plan to be particularly useful to those carrying on Nature work in camps. Suggested weekly or two week programs will be given together with suggestions for useful organization of groups for field work. Much of the type of information which has formerly appeared on this page will hereafter be found in the section devoted to Nature News and Views.

Many Nature students will seek to improve themselves along Nature lines through attendance at summer school. A large number of colleges, universities and normal schools are now offering courses either definitely named as Nature Study or adjusted to the wants of Nature students who do not necessarily wish to become high-brow specialists. The National Summer School of Utah Agricultural College at Logan, Utah, will offer courses of this sort for the third consecutive summer. The campus is ideally located at the entrance of Logan Canyon and offers splendid opportunity for the study of mountain life as well as the life of lowlands such as surround Great Salt Lake. Those interested in spending their summers near large cities may find the courses offered at Chicago University more to their liking. Still others who wish to carry on their work in the east may find helpful courses at Cornell University, Pennsylvania State College, Columbia University, and other institutions which might be mentioned. The tendency which seems to be developing towards the introduction of these courses in institutions of higher learning is most encouraging. It may serve to overcome some of the handicaps which the Nature movement has had to survive through the leadship of interested but inadequately prepared individuals.

A Nature Almanac is soon to be published by the American Nature Association. This will in a way be a companion book to the Forestry Almanac published by the American Tree Association. It will be designed to supply information relative to the organizations identified with the Nature movement as well as specific helps in the formation of Nature courses for use in school systems, in camps and in club organizations. It is hoped that this will be available in the early summer months.

The eighth Camp Leadership Course offered by Columbia University was held this year at Bear Mountain Inn, Palisades Interstate Park, from April 14-18. About one hundred and fifty individuals representing most parts of the country were present. This number included a group of Campfire Girls leaders who held a conference the week before at Buckhill Falls.

BLISTER BEETLES

AMONG our common injurious insects we find the blister-beetle family. They are remarkable on account of the greater number of changes that they undergo during their life compared to the usual metamorphosis of most beetles. Blister beetles are soft-bodied, slender-legged insects of medium or large size, with broad heads and narrow thoraxes, and are usually slender in form. They vary in colors from gray, black or brown to bright metallic shades of red, blue, green or yellow. All of them are vegetable feeders in the adult stage, their food consisting of the leaves, flower petals or pollen of various species of plants.

PHOTOGRAPH CORNELIA CLARKE

TWO MARGINED BLISTER BEETLES
Greatly enlarged picture of two members of the family of interesting but damaging insects.

Our most common and destructive species in the East, belonging to the genus *Epicauta,* does considerable damage in our gardens. A yellow and black-striped form is known as the "old-fashioned potato beetle." The "margined blister beetle," shown here, is also known to attack potatoes, and completely defoliates the plants in certain areas. They also feed on the foliage of beets, tomatoes, and especially clematis. This species is grayish-black in color, always with the margins of the wing covers gray. It measures about five-eighths of an inch in length. One of our most common species is the black blister beetle that occurs very commonly on goldenrod.

But all this has nothing to do with the name "blister beetle," which was given to it on account of its peculiar physiological properties. A substance called "cantharidin" is found to a greater or less extent in the bodies of nearly all members of the family. This substance when applied to the skin causes an inflammatory or blistering effect. To utilize this property the beetles are dried and pulverized, and the powder thus obtained is made use of in medicine. The beetles in general use for this purpose come from Spain and other European countries, and are known under the name of "Spanish fly."

Returning to the remarkable life history, we find that the adult females deposit large numbers of eggs on the ground or on plants, depending on the species of blister beetles concerned. These eggs hatch into very long-legged larvae that run about in search of food. Some of these active youngsters find the eggs of grasshoppers upon which they feed, and it would seem that they were beneficial. According to statistics, however, even this habit is of questionable value, as they also destroy other more valuable parasites of the grasshopper eggs.

Other species of these slender-legged blister beetle larva find a situation where they watch for bees. When the right one comes along, they attach themselves to the hairy body, and are carried home by the unsuspecting bee to her nest. Here the young blister beetle after stealing the ride, makes itself at home in the bee's nest, and proceeds to devour the bee eggs and larvae, and finally the accumulated stores that were provided for the young bees. During this time the blister beetle has completed its own complicated life cycle, has transformed completely, and instead of the bee an adult beetle will emerge.

Triceratops, a Horned Dinosaur

By C. W. Gilmore

Curator of Vertebrate Paleontology, U. S. National Museum

MANY years ago a cowboy riding over the "Bad Land" country in eastern Wyoming was attracted by a horn-shaped object which he saw protruding from a ledge of sandstone. Dismounting, he broke off this projecting end and returned with it to the ranch where later it fell into the hands of Mr. J. B. Hatcher, an enthusiastic collector of fossil specimens, who recognized it as the horn core of some extinct animal. This incident marked the discovery of the famous Lance Creek locality which has since become classic ground on account of the great number of horned dinosaur specimens that have been found there. Hatcher in the course of three seasons' work collected here no less than forty skulls of the huge-headed dinosaur known as *Triceratops*.

TRICERATOPS, PERHAPS LONG FOR TRICKY

He gets his name from his three-horned face which protected a small brain from injury in battle

Triceratops (three-horned-face) so named in allusion to the three horns with which the skull is adorned, was the largest headed land animal the world has ever known. Skulls have been found measuring eight feet in length, though an average specimen would be about six feet. This great length of head is largely due to the bony frill which projects backward over the neck like a fireman's helmet, and reminds one of the large ruffs worn at the back of the neck in Queen Elizabeth's time.

An articulated skeleton of one of these animals on exhibition in the U. S. National Museum in Washington is about twenty feet long and stands eight feet high at the hips. Although the largest-headed animal the brain of this creature is remarkably small, being little more than the size of a man's closed fist.

That *Triceratops* engaged in combat seems to be shown by the broken bones that are often found which have healed during the life of the animal. A pair of horns in the National Museum show the results of such an encounter for it is evident that one of them was broken in life from the fact that the stump had rounded over and healed, while the size of th horns shows the animal to have reached a good old age.

The difficulties of collecting these huge skulls can well be imagined, when it is stated that one of them in the enveloping rock weighed nearly two tons when ready for shipment in a deep canyon, fifty miles from the railway.

In earlier restorations of *Triceratops* the skin covering was represented as being smooth and leathery, but the discovery in recent years of large patches of skin impressions show it to be made up of a series of non-imbricating scales of various sizes. This restoration embodies all of the evidence of more recent discoveries and to that extent at least presents a truer conception of the life appearance of this animal. Future discoveries will undoubtedly add other details as well as show errors and inconsistencies in the present conception. Only through such revisions may we hope to represent such extince species.

In its feeding habits *Triceratops* was manifestly plant eating as indicated by the teeth and the cropping beak, the food plants probably being low shrubs and trees.

Hatcher has pictured the country at the time these animals lived as being a region made up of vast swamps with wide water courses that were constantly shifting their channels, the whole presenting an appearance not unlike the conditions now existing in the itnerior of the Everglades of Florida. The entire region, where the waters were not too deep, were covered by an abundant vegetation of palms and other semi-tropical plant life, and inhabited by these huge dinosaurs as well as by the smaller crocodiles, alligators, turtles, lizards and diminutive mammals, all of whose fossil remains are now found in the rocks of these Upper Cretaceous deposits.

Nature News and Views

Mammal Society Meets

The 9th annual stated meeting of the American Society of Mammalogists was held at the Academy of Natural Sciences, Philadelphia, Pa., April 26 to 30, 1927. The reading of papers, forming the principal feature, began on the morning of April 27 and continued for three days. These papers covered a wide variety of subjects, ranging from observations on the habits of single species to learned dissertations on studies which had occupied the authors for months or years. A majority of the animals considered were inhabitants of North America, but several papers related to African subjects, and the whales and other mammals of the seven seas were accorded some time, being discussed from the standpoints of distribution, habits, commercial exploitation and anatomy.

The wide range of subjects treated may be illustrated by mentioning some of the addresses, the titles being informally stated: Life History of the Columbian Ground Squirrel; Tracks in the Snow; Adirondack Mammals; A Tame Woodchuck; Poisonous Mushrooms Eaten by Red Squirrels; Swimming of the Water Shrew; Comparison of the Weights of Largest and Smallest Mammals; Evolution of Common Names of Mammals; Collecting in Liberia; Literature on the Elk; A Research Program; Anatomy of the Narwhal; Methods in Visual Education; and Fluctuation in Mammal Populations. The question of man's origin was discussed more or less directly in such papers as "The Placentation of Primates, with a Consideration of the phylogeny of the placenta" and "How Near is the Relationship of man with the Chimpanzee-gorilla Stock," illustrated papers that might with profit be considered by those who doubt man's relationship with the lower animals.

The threatened extermination of some of our fur-bearers, caused by their relentless pursuit for purposes of adornment, evoked considerable discussion. The beaver, one of our most interesting and intelligent mammals, formed the subject of several papers, one illustrated by remarkable motion pictures. Beaver culture was considered, and the Louisiana muskrat, a species once enormously abundant, but fast being reduced, formed the subject of one paper.

Notable motion pictures included a record of the Smithsonian-Chrysler Expedition to Africa, detailing the methods used in obtaining animals for the National Zoological Park, and Canadian Government films of the capture of whales, on methods of collecting fossil animals in Alberta, and on the Moose.

The meeting was further notable by reason of the visit on the last day of the session, to the famous Zoological Gardens, the oldest in America, where luncheon was served to all the members and their friends. On the other days, the visiting members were the luncheon guests of an anonymous, but much-appreciated friend, and the annual dinner, on the evening of the 28th, was delightful by reason of its informality, and the opportunity afforded several prominent members to deliver impromptu speeches that gave the usual evidence of careful preparation.

The membership of the Society includes a considerable number of the members of the American Nature Association, and community of interest is further indicated by the fact that two members of our scientific consulting board are on the board of directors. The Society voted to hold its next meeting in Washington.—E. A. P.

In response to a number of requests we are reprinting The Ten Commandments of the Trail, originally published in the January issue of Nature Magazine.

TEN COMMANDMENTS OF THE TRAIL

By Henry Wellington Wack, F. R. G. S.
(Copyright, 1926)

First. Use the By-Ways—not the Highways.

Second. Don't go Walking to beg a Ride. The auto-riding Hiker is a Fraud.

Third. Everything belongs to Somebody. Then respect all Private and Public Property. Be not the Author of its displacement, disfigurement or disappearance.

Fourth. Keep off Prohibited Ground. Neither fish nor hunt on Posted Land. Trespassers create bad will toward all Nature Lovers, Campers and Sportsmen.

Fifth. Leave Gates, Fences, Signs, Stakes, growing grain and crops as you found them. Walk around, never across, all planted fields.

Sixth. Pluck no wild flowers—they belong to all. Leave them for all to enjoy. Pick no cultivated Fruit. Resist the boyhood call of the Melon Patch!

Seventh. Clear away twigs, leaves and pine needles down to moist earth, before laying a Camp Fire one foot square. Keep cook fires low, and less than one-fifth the size of the clearing. Large fires prevent cooking, but destroy forests. Only small fires are safe, quick and comfortable to cook with. Put camp fires out with Water, not with a kick. See that the peat or humus around the fire is not burning underground to destroy the woodland after you have left. A single spark may fly a hundred feet and burn a million trees. Arson is no greater crime than stupidity or neglect on the Trail.

Eighth. Leave campsites clean; Burn all garbage; replace cut Firewood and Supplies found in camps. You are the Guest of an absent Host—not the vandal of a present opportunity. Leave a note of thanks in a wilderness shelter you have used. Put it in order before you depart.

Ninth. Silence, or speech in whispers, is the sign of trail experience and good woodmanship. Only fools and asses bray in a Forest.

Tenth. When you leave a beautiful Woodland or descend from a Mountain, stop, turn around, and gaze reverently awhile. Then thank God for the boon our Forests are to all Mankind. Treat Life's Trail responsibly and keep it clean. To the seeing eye and the generous soul, Nature's beauty—her mysteries and charm—forever call us to her Trails!

More Nature Columns

Still the returns roll in concerning Nature columns in the daily newspapers and other general publications whose editors have recognized the considerable and growing interest of the reading public in Nature. The Pittsburgh (Pa.) *Sun* is forunate to have such a

Your Garden can be made the happiest part of your home

THERE is something about the intimate confidence and trust of the wild birds that brings joy to the hearts of everyone. Possibly no other living things are so quick to sense the protection and welcome that properly designed houses and shelters afford.

One can watch them with untiring interest as they hop from twig to twig, working and singing the whole day through, ridding your cherished trees, shrubs, flowers and premises of injurious moths, beetles, mites, mosquitoes and other insect pests.

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Dodson Scientific Wren House as shown at left

The Silver Throated Wren is one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green with cypress shingles, copper coping, comes complete with rust-proof snap-on hanger. Size 28 in. high by 18 in. in diameter. *Price* **$7.00**

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of 48 rooms. This beautiful house with its specially ventilated garrets, porches and other patented details has proven a sure lure for these most useful and fascinating birds. A large house size 36x26x37 inches; copper roof, including 22 ft. easy raising and lowering pole only **$60.00**. Others as low as **$18.00**.

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Is a sure lure for these very useful birds. Trees in cities are so well taken care of that Flickers have difficulty in finding homes. They, therefore, take very readily to Dodson's Scientifically Built Houses. Flickers are one of the most useful birds, destroying moths, tree pests and principally ants on trees and ground. Many letters have been received stating that ants have mysteriously vanished since these birds have found homes. House 28½ in. high, 10 in. in diameter. *Price* **$7.00.**

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Also send me ..... set of nearly 1000 Nature Pictures and Free Book.

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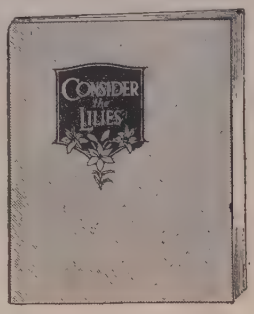
The book, "Consider the Lilies", which we have just published at considerable expense, will, we believe, be of great interest to every home owner and gardener.

It covers, in every detail, the history, description, planting and cultural directions of one hundred and one varieties with illustrations of sixty-five varieties in natural colors.

Postpaid on receipt of $1.00, which amount may be deducted on an order for bulbs, amounting to $3.00 or over.



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column written by a Nature-loving lawyer of that city, Mr. Edmund W. Arthur. It carries the title of "The Rambler's Column" and is delightfully written. Mr. Arthur used to contribute this column daily but this became quite a task for a busy professional man, so his contribution is now a Wednesday and Saturday feature.

Mr. Robert Sparks Walker is the author of a Nature department that is a regular feature of *The New South*, a new magazine "of Southern thought and opportunity," published in Chattanooga, Tennessee. Mr. Walker, well known in the field of Nature writing and as a poet, is a happy choice for this work. The magazine is a newcomer in the field, is attractively edited and interestingly filled with material.

Progress With Bulbs

American bulb growers have made remarkable progress in the industry considering the short time that has been devoted to it and the outlook for production of bulbs in this country is decidedly bright. This is the conclusion of Dr. David Griffiths, horticulturist of the United States Department of Agriculture, whose investigations with American bulbs under glass have been summed up in Department Bulletin 1462-D, just issued.

Doctor Griffiths has conducted tests with many varieties in an effort to determine whether the bulb stocks grown in various portions of this country force satisfactorily, to determine their shortcomings, and to offer suggestions for their improvement. The tests brought out some imperfections which he says are a demonstration not of lack of adaptability of the stocks to American conditions but of a lack of information

WILD FLOWER COLOR PLATES

Red Columbine, Lotus, Lady's Slipper, Dutchman's Breeches, Mt. Laurel, Dogwood, Bloodroot, Trailing Arbutus, Cardinal, White Trillium, Fringed Gentian, and Maidenhair Fern on post cards, 27 cents; $20 per 100 sets. 2 sets of 6 from Feb. and May Nature Magazine, 12 cents per set; $10 per 100 sets.

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12 cents per doz., 75 cents per 100, 10 cents each for 25 or more Jr. members brings button, pledge, 6 outlines, circulars, for each; 12 color plates and periodical for organizer.

Plant Wild Flower Seed

Red Columbine, Holly, Yucca & Dogwood, 12 cents per packet.
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Annual members with quarterly periodical, Wild Flower, $1.50; contributing members (with periodical) $5; sustaining members (with periodical) $10. Color plates free to members with periodical.

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relative to the requirements of the crops.

American-grown bulb stocks on the whole, are likely to be less uniform in their performance than foreign stocks, but are just as productive and responsive under glass when suitably handled. On this account stocks from widely separated localities should not be mixed. Storage should receive more careful attention. Overexposure is common, and sometimes heating is evident. Injury in the pack is not uncommon. It is imperative that the large pack be well crated.

Conchologists Attention

One of our members, Miss Nell Lounsberry, Box 41, Newport Beach, California, would like to "trade cowrie shells with people all over the world." In asking us to present her request she asks prospective correspondents, "What do you want in exchanfie—shells, magazines, starfish, letters or coin?"

Butterfly Collection

Oliver F. Young, R. F. D. 1, Fillmore, California, would like to exchange butterflies with collectors in other localities. He is a collector himself.

Maine for Chickadee

With the backing of the Maine Federation of Women's Clubs, the chickadee has been duly and rightfully honored by being selected as the State Bird of Maine. This was confirmed by the recent session of the Legislature. Calling this to our attention, Marion S. Buzzell of the University of Maine says, "The choice of the chickadee is a very popular one for Maine folks. Under June skies or in the bitter cold and dreariness of a January blizzard, it matter not, the merry 'chicka-dee-dee' of this 'little scrap of valor' rings out over hill and meadow." What state is next?

Movie Summer School

Members of the growing body of amateur motion picture photographers will undoubtedly be interested in the third annual session of the DeVry Summer School of Visual Education. It is a five day session from June 2 to July 1. Tuition is free to teachers and ministers. Details can be obtained by writing to the DeVry Corporation, 1111 Center Street, Chicago, Illinois.

Nature Program

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its Department of Recreation. In many communities the activities of such a department are directed more to playground equipment and games than to endeavors that help mentally as well as physically. In Reading, however, they seem to have the Nature viewpoint. The Department publishes a monthly Nature bulletin in mimeograph form that is highly useful. Miss Lillian M. DeTurk, administrative secretary of the department writes a weekly Nature column for the Reading *Eagle*, which paper, no doubt, will eventually see the value of such a column more frequently. Mr. E. A. Prichard is superintendent of recreation.

State Park Campers

The problem of where to go, for picknicking and camping, by motor tourists who seek nearby places for outdoor recreation in the New York City and northern New Jersey metropolitan district, is readily solved, in the Harriman State Park. Its forty thousand acres of woods and hills, in the Highlands of the Hudson and the Ramapo mountains on the western border of Rockland County and the southern corner of Orange County, New York, and its seventy miles of hard surfaced and good dirt roads, accessible from a dozen highway entrances to the people of southern New York and northern New Jersey, offer unrestricted enjoyment in the largest state preserve within a hundred miles of the metropolis.

Mt. Hood Saved

The snow-crowned summit of Mount Hood, Oregon's most famous mountain peak, is to remain, for the next few years at least, a goal attainable only by those willing to essay the stiff climb on foot, as a result of a decision just made by Col. William B. Greeley, Chief of the Forest Service, United States Department of Agriculture. A permit was refused a commercial company that asked permission to construct an incline cableway to the summit of Mount Hood, with rest rooms and lunch rooms at

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People and objects miles away seem close. New pleasures for home, farm, travel, sport. See Sun, Moon, Stars as never before! P. Brush wrote: "Watched submarine 8 miles off coast." C. Scribner: "See lighthouse 18 miles away."

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Measures 12 inches closed, opens out 3¼ ft. Brass bound, powerful lenses protected by dust caps.

Free Carrying-Case with Shoulder-Strap. Also Solar Eye Piece to view Sun—a feature found only on expensive instruments.

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the top and midway stations. In denying the application, the Chief Forester declared he was moved largely by the deep-seated reverence that he believed should be preserved for mountain peaks having the grandeur of Oregon's highest mountain. He said the material gains in tourist traffic, in his opinion, would fail to compensate for the loss in esthetic and sentimental value of such an outstanding natural feature, if it were subjected to commercial development.

Bulb Imports Cut

Importations of Narcissus bulbs during the fall of 1927 for propagation purposes will be limited to 100,000 bulbs per variety for each importer, according to an order issued by the Federal Horticultural Board, United States Department of Agriculture. This limitation, however, does not apply to the Chinese sacred lily (Narcissus) but the quantity of this variety authorized is to be indicated in the permit. The Board has also ordered that further special permits shall be refused for the Narcissus varieties, Golden Spur, Emperor, Victoria, and Princeps, inasmuch as these varieties are believed to be now available in the United States in sufficient quantity to meet essential propagation needs. It is estimated that 288 American bulb growers now have plantings totaling 134,000,00 bulbs of the various varieties. On the basis of former importations it is believed that 7,000,000 marketable bulbs will be sufficient to take care of the normal consumption needs of the United States.

Reindeer Herds Increase

About twenty-five years ago a stock of 1280 reindeer was brought from Siberia to Alaska. Today they number 350,000 and represent an important factor in the development of the Territory, says the United States Biological Survey. A special investigation has been carried on to determine the best range and feeding conditions, and the best means of improving the herds. The results of this inquiry are contained in a recent bulletin, 1423-D of the United States Department of Agriculture, copies of which may be obtained by writing to the Department.

See Inside Front Cover
for
Association Activities

SW

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than those costing double," W. F. D., Annapolis, Md. "Sees people 10 miles away." W. W. F., Cincinnati, Ohio.

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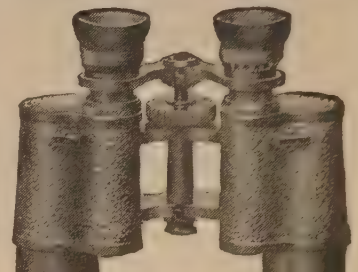

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Du Maurier Co. Dept. 86 Elmira, N. Y.

FOR NATURALISTS AND PET BUYERS

Audubon Bird Charts

Twenty-six Common Birds
(In Color)

Drawn by EDWARD KNOBEL
under the direction of RALPH HOFFMANN
The Birds pictured as as follows:

Red-wonged Blackbird	Golden-crowned Kinglet
Bluebird	Robin
Catbird	Chipping Sparrow
Bobolink	Song Sparrow
Cedar Bird	Barn Sparrow
Chickadee	Chimney Swift
Purple Finch	Scarlet Tanager
Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
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Interesting - Instructive

Awakes the itnerest of children in our common birds with these charts depicting the natural colored, life-size birds in their characteristic attitudes. They are practical and helpful in all nature study and drawing.

Lithographed and mounted on cloth. Size 72x42 inches

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Home Schoolroom Libary

Four Beautiful Charts

Price $2.50 Each

AMERICAN NATURE ASSOCIATION
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Washington, D. C.

Jummie, A Canary

When Jummie was nine days old his mother deserted him and his foster mother, Mrs. George F. Bicknell, of East Chicago, Indiana, set about to raise him, feeding him egg yolk mixed with cream from a medicine dropper every two hours. He grew and prospered, developing a sweet song, serving as an unfailing alarm clock for Dr. Bicknell, mastering the trick of picking eleven toothpicks from a container, eating meals with the family and responding to his name. He has the run of the house. It seems that Dr. Bicknell has a common habit of trying to get in a last forty winks after he has been called to breakfast. Jummie watches this human failing and immediately perches on his master's nose and sings for all he is worth. Mrs. Bicknell says this alone makes the bird worth his weight in gold.

Alaska Game Refuges

President Coolidge, by recent Executive order, has set aside certain areas along the Alaska Railroad as a preserve and breeding ground for muskrats and beavers, and a tract of fourteen square miles about the Government hotel at Curry, Alaska, which is also on the railroad, as a refuge for the protection of wild birds and game and fur-bearing animals. In the area at Curry fishing will be regulated by the Secretary of Commerce; and the hunting and trapping of birds and game and fur-bearing animals, other than brown and grizzly bears, wolves, and wolverenes, will be permitted only under regulations to be prescribed by the Secretary of Agriculture, in accordance with the Alaska game law.

Packard Birdhouses
$1.00 Each
Why Pay More?
(Wt. packed 2 lbs. each. By mail, postage extra)

Used and endorsed by the Massachusetts Audubon Society for the protection of birds. Artistic, durable, ventilated, easily cleaned, easily put up—and **the birds love them.** All sizes, same price.

Everything for Wild Birds—Catalog Free

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3 for $5.00

CRESCENT SPARROW TRAP $5.00
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WILD DUCK EGGS

I have now for sale Wild Mallard eggs; also the purebred small tame variety of English Grey Call Duck eggs. These are the celebrated W. E. decoys. Nearly every variety of wild duck respond to their soft enticing call. Full instructions with shipment how to set eggs and raise young successfully.

WALLACE EVANS GAME FARM, St. Charles, Ill.

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For Cozy Dens
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Complete the charm of your cozy den or summer cottage with fur rugs, mounted animals and birds, horns, antlers and novelties by Jonas Bros. Free Art Catalogue on request, with price list.

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Get Rid of Sparrows!

FREE extra cage to empty sparrows given with each trap

English Sparrows cost poultry owners thousands of dollars everyy ear. They Drive away the song birds. An Everset Trap will catch 10 to 25 sparrows a day. Costs nothing to operate—chicken feed or small grain is the only bait needed. Nothing to get out of order; lasts indefinitely. One baiting catches 50 to 100 sparrows without resetting. Write for full information.

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A big saving on wire netting in all sizes for any type of bird or animal enclosure. Wholesale prices and prompt delivery from our large stocks at Clinton, Mass.: Chicago, Seattle and Minneapolis.

Free Catalogue on Crown Pen Materials

Crown Iron Works Co. 1253 Tyler St., N. E.—Minneapolis

Cucumber Disease

In that part of the United States where cucumbers are raised in quantity and are utilized in pickling plants, the success of the cucumber crop is of no small importance. A disease called the "cucumber mosaic" has for some time threatened the cucumber vines in the Central and Eastern States. The Department of Agriculture has demonstrated that the disease passes a comfortable winter as the guest of other plants, and after a winter season securely protected in the seed or root of the wild cucumber, milkweed, wild ground cherry, pokeweed and catnip, issues forth to ravage the little pickles and their leaves. Therefore these "host plants" are in bad repute and war should be waged upon all these appearing in proximity to farm buildings and vegetable gardens. Insects, true to form, contribute to the spread of the mosaic, the plant lice and cucumber beetles being chief offenders.

New Paper Pulps

The pulp from which newsprint paper is made has been almost entirely dependent upon the spruce for its source of supply, requiring the importation of large quantities of that wood. Through a new, semi-chemical process developed by the Forest Products Laboratory of the U. S. Forest Service, paper of the weight and thickness of newsprint, made wholly from semi-chemical pulp of black, tupelo, or red gum, or aspen, birch or maple, has been found to have greater strength than the present commercial newsprint, according to a recent announcement of the U. S. Department of Agriculture. This new pulping process offers the possibility of producing a high yield of cheap print paper and of shifting the burden of newsprint production to the hardwood forests of the North, East and South.

New Tree Disease

Another enemy of the forest has been discovered in two localities in New York State in the form of a gall-rust disease of pine trees, called, for want of better name, Woodgate rust, after the name of the town where it was first detected. Thus far it has been noted only on Scotch pine but any such disease awakens fear of another such epidemic as the white-pine blister rust. So far as can be determined, this disease can pass directly from pine to pine, skipping the usual intermediate stage where some other plant is host. In trees severely attacked the parts of the trees above the galls either die, which seems always to be the case in young trees, or, in the case of trees which live for some years after attack "witches' brooms" are formed which dwarf the tree and ruin it for timber. In many instances the galls occurred on the twigs and small branches as thickly as beads on a string. The individual galls are globular, and both the galls and brooms are very conspicuous.

THE CALL OF SUNSET

When the scarlet dances on the water, and the frogs and crickets start their evening overture, then you hear the sunset's call to rest.

Vacation's greatest joys are after sunset—the yarn, the pipe, the open fire, the Nature scented sleep.

Thousands of vacationists enjoy this after-sunset rest to the highest degree on Rustic Hickory Furniture—the natural wood furniture for every summer use, inside or out—the last word in comfort, beauty and durability. It feels as if it was made to your measure. Its natural charm adds greatly to the appearance of any summer building or lawn. If you forget to "take it in" at night, the big storm won't hurt it.

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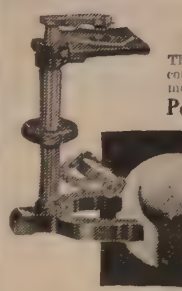
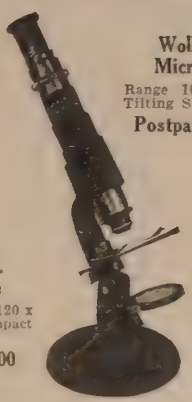
Your Choice *of* Microscopes



Ultralens Microscope
The finest of compact instruments.
Postpaid $7.50



Wollensak Microscope
Range 100 to 250 x Tilting Stand.
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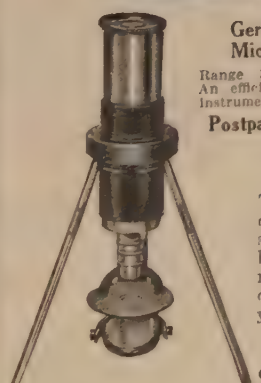
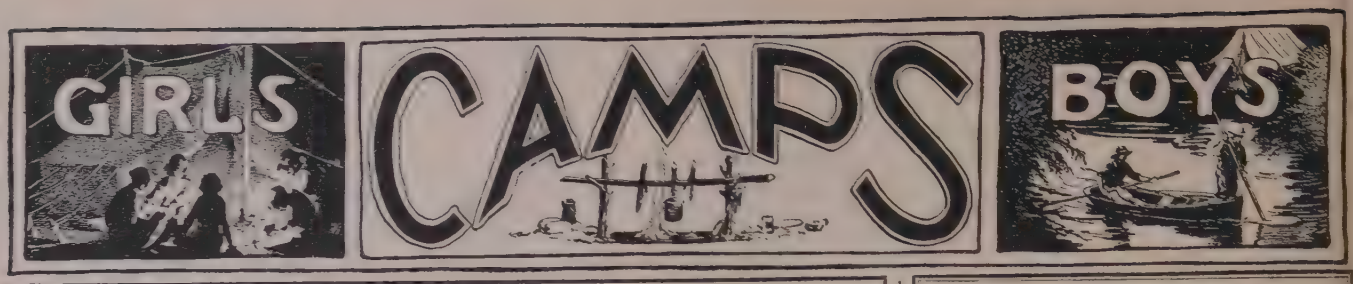


German Jr. Microscope
Range 30 to 120 x An efficient, compact instrument.
Postpaid $10.00

This Company can supply you, not only with its own Ultralens Microscope, magnifying to 225 diameters but with these other imported instruments. You should find among this choice just the microscope to suit your needs. Write for Catalog.

Tami Microscope
Fine, pocket size and simple in operation
Postpaid $20.00

Scientific Apparatus Corp., Dept. 205, Milton, Pa.



THE NATURE LORE SCHOOL

CAMP ANDREE
Briar Cliff Manor, New York
Term—June 17 to June 30, 1927

ORGANIZATION: The NATURE LORE SCHOOL will be run on the Camp plan with the Patrol System. There will be three encampments,—one for men and two for women.

THE STAFF HEADED BY
Dr. William G. Vinal, Professor at N. Y. State College of Forestry.
Director of Nature Guiding, American Nature Asso.

EXPENSE: The fee is $20.00 per week or $40.00 for the course, $2.00 of which is payable upon application.
Checks and Money Orders may be made payable to Girl Scouts, Inc., and sent with application as early as possible to Miss Elin A. Lindinberg, **Girl Scouts, Inc.**, 670 Lexington Avenue, New York City.

DETAILS: A bulletin describing courses of study, method of enrollment, life at camp, etc., will be sent upon application to

Camp Editor, NATURE MAGAZINE, Washington, D. C.

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The Ideal Camp for Girls

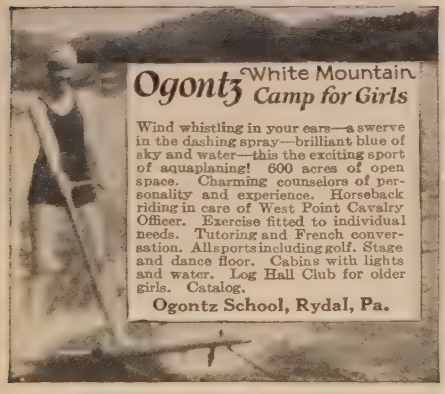
Nestled on the shores of a delightfully secluded lake, and in the midst of the picturesque Maine woods, 10 miles from Camden and Rockland.

Land and Water Sports Music—Dramatics—Crafts
Rythmic Dancing

Reservations now being made for the season, July 1st-Aug. 26th. Ages 10 to 18 years.

For booklet and complete information address

Miss Florence T. Littlehales
205 West 94th Street, New York City After June 1, Union, Maine



Ogontz White Mountain *Camp for Girls*

Wind whistling in your ears—a swerve in the dashing spray—brilliant blue of sky and water—this the exciting sport of aquaplaning! 600 acres of open space. Charming counselors of personality and experience. Horseback riding in care of West Point Cavalry Officer. Exercise fitted to individual needs. Tutoring and French conversation. All sports including golf. Stage and dance floor. Cabins with lights and water. Log Hall Club for older girls. Catalog.

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A Choice Summer Camp for Boys on Lake Quan-ta-ba-cook near Searsmont, Maine

Water Sports, Athletics, Hiking, Riding, Long Canoe Trips
Camp Fire Circle with Indian Rites
Cruises along islands of Penobscot Bay

Exceptional Care and Personal Supervision Given Every Boy

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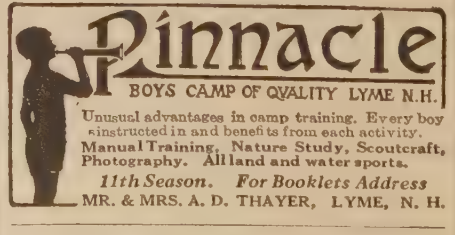
CAMP INKOWA Greenwood Lake, Orange County, New York; Nine Mile Lake, forty-five miles from New York. Six hundred feet elevation.

Junior Camp—Girls ten to fourteen
Intermediate—Girls fourteen to sixteen
Senior Camp—Young women over sixteen

INKOWA HOUSE For men and women guests. All modern improvements; Refined atmosphere. Swimming; Canoeing; Fishing; Horseback Riding; Tennis, Athletics; Expert Leadership; References required. Send for booklet.

CAMP INKOWA Greenwood Lake, N. Y. **INKOWA HOUSE** Telephone—Greenwood Lake 31



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Manual Training, Nature Study, Scoutcraft, Photography. All land and water sports.

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Mountain and Lake Regio, Wayne Co., Pa. Elevation 2250 ft. Lake ownership. Junior, Intermediate and Senior camps. Horseback riding. Ninth year. July and August. $250.00. *Booklet.* Mr. and Mrs. Harry Davison, Box C, 1130-E. Haines St. Philadelphia, Pa.

Camp Naidni Lake Dunmore, Vt. For Girls 8-21. Wholesome vacation camp, 50 acres. ½ mile lake front. Swimming, Canoeing, Hikes, Gypsy Trips. Healthful food. Personal supervision. $200 season. For information apply to:
MRS. G. C. BRITTEN, Camp Telephone, Salisbury 13 Ring 14 Lake Dunmore, Vt.

See Yellowstone Park This Summer

The Summer Activities Department of SIDWELLS' FRIENDS SCHOOL, Washington, D. C., announces "THE WESTERN TRIP FOR GIRLS," and "YELLOWSTONE COLORADO CAMP TRIP FOR BOYS." The trips are conducted by cultured councilors' experienced. The headquarters of the camp is Colorado Springs in the Pike-Peak region. The climate and beauty of this section of the Rockies is unsurpassed. Here the campers will have the usual summer camp activities and in addition will enjoy the travel and the broadening influence of western experience. The camp will be divided into Junior and Senior groups, and will be limited to twenty. Swimming, golf, horseback riding, tennis, and hiking are among the activities. The campers will be properly chaperoned by experienced counselors at all times.

The duration of the camp will be nine weeks, from July 4 to September 5, one week longer than the usual camp season. This has been arranged at the request of parents who wish their children to avoid the hot weather of late August and early September. To those experienced in travel the length of the trip both in time and distance would suggest a much larger cost. By comparison with the usual travel expenses the charge, is very nominal. The charge includes railroad and Pullman fares, meals, hotel expenses, sightseeing and other trips, laundry, horseback riding and living expenses. There are no extra charges.

A detailed statement of the itinerary may be found in the Yellowstone-Colorado pamphlet.

For other information address

Summer Activities Dept. Sidwells' Friends School, Washington, D. C.

Send the Boy to the Rockies!

In Mr. Caldwell's nature camp for boys, trees, birds, flowers, photography, wood carving, bird calls, etc., are taught by nationally known men of wide experience.

Hiking, swimming, horsemanship, archery, etc. Elevation of camp 9,000 feet. Excellent food and water (dairy adjoins). Ask for details.

GUY C. CALDWELL, *Director*

ROCKY MOUNTAIN NATURE CAMP
Long's Peak, Colo.

QUINNEH TUK CAMPS

Land and Water Sports. Riding Horses and Ponies. Campus 200 acres. Quinneh Tuk Camp for Boys. Pauchaug Camp for Girls. Family Camp—playground for children.

MR and MRS. HOWARD A. M. BRIGGS
Squakheag, Northfield, Mass.

DEMONSTRATION *of* NATURE GUIDING *for* SUMMER CAMPS

A New Feature Offered by the American Nature Association. Publishers of Nature Magazine

The American Nature Association recognize the importance of the summer camp in the conservation of the forests and wild life protection and believes that nature study is the fundameutal key to good camping. It further recognizes that there is a scarcity of leaders who are able to put the idea across in the nature lore way. The Association has consequently made it possible for some of the camps who are really doing nature work to have the services of a nature guide.

We are able to announce at this time that DR. WILLIAM G. VINAL has been attached to the staff of the Association and will give his entire summer to NATURE SERVICE FOR CAMPS.

Nature Club

Janet and Robert Southam of Rockliffe, Ottawa, Canada, are the leading figures in a little Nature Club that owes its creation to three field mice. These little wanderers were cared for and studied, leading to the thought of studying many other things of Nature. The club now has ten members, all of them young people, publishes a little newspaper about Nature, maintains a wild flower garden and house garden, and is host to all wild things.

Mismated Friends

"All through March there came to my side door for lunch a very much mismated pair of feathered friends," writes Zina H. Allbee of Bellows Falls, Vermont. "One was a plump robin and the other a common pigeon. The pigeon came alone all winter and had little to do with other pigeons. He was quite forlorn until the lonely robin came along and a close friendship sprang up between them. After that they always came together and had many a conference over the best pieces of doughnut and bread. The robin was partial to doughnut crumbs and the pigeon seemed to say, 'Very well, I'd as soon have bread.'"

Lost—One Flamingo

Have any of our Florida members seen a stray white African flamingo which has flown away from the Mountain Lake Sanctuary at Lake Wales, Florida? Mr. H. H. Nomabell, director of the sanctuary, would appreciate any word that he can get about this bird. He writes that no wild flamingoes have been seen in Florida since 1921 and that this bird should be easy to identify. It resembles the native scarlet flamingo in build but is white in color except for the undersides of the wings, which are black and clearly shown in flight. The bill is black and legs pink in repose.

"He had always appeared well and happy with us and spent most of the day looking for food in the pool," Mr. Nomabell's letter continues. "About the seventh of December he began to be restless every evening at sunset. At this time cranes were seen flying eastward over the pool in the direction of Lake Pierce. These seemed to call to him and he would answer. Also at this time he ate very lightly. We had decided to catch him and examine his wings but before we could do so, on the eleventh of December at sunset, after calling to the other flamingoes, who tried to follow him, he rose from the water to a height of about one hundred and fifty feet and made off at an amazing speed toward the east.

"We have had reports of his having been seen on various local lakes but searching parties have found only herons and cranes. We hope he has escaped the sportsmen and that no harm has befallen him. It is hoped that some day the flamingoes will be induced to return to Florida."

Plan your next holiday

to the Kruger National Big Game Park, where you can shoot to your heart's content Wild Big Game in their natural surroundings with your Movie-camera (guns forbidden).
When in South Africa, enjoy the Romance of Diamonds, Ostrich Feathers and Gold; see also, among many other attractive features
Giant Victoria Falls
The Cango Wonder Caves
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Quaint Kaffir Kraals in Zululand
The Glorious Cape with its picturesque mountains, sea and shore motor roads
Your sea-journey is over the "World's Sunshine" route

Comfortable travel by rail in South Africa between cities with good hotels.

Write for free booklet "Cape to Cairo" or send 12 cents for postage for illustrated travel literature.

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An absorbing and fascinating way of seeing Nature's hidden marvels. A chance to make and examine your own prepared microscope slides. The Bio-Set will not only give you excellent results, but will also be a source of invaluable information and endless enjoyment to you and the rest of the family.

THE BIO-SET

A complete slide making outfit for young and old, consisting of the well-known Wollensak Microscope magnifying up to 250 diameters, a complete set of fine dissecting instruments, permanent microscope slides all ready for use, blank slides and cover glasses, preserved plant and animal specimens for making your own slides, together with the necessary stains, chemicals, and reagents; and, in addition, a copy of "An Introduction to Slide Making", giving full but simple directions for making your own permanent slides. Supplied complete in a beautifully finished wood frame box.

The **BIO-SET.** Complete, charges prepaid **$24.50**
The **BIO-SET JUNIOR.** Similar outfit, but with Wollensak microscope magnifying 100 diameters. Complete, charges prepaid **$14.75**

Just The Thing You've Been Looking For! Send For Your Bio-Set Today!

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MILLER'S A-1 PRODUCTS

For Sale Everywhere!

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Battle Creek Health Food for Dogs

Let Him be the **JUDGE**

When you feed your dog KEN-L-RATION you give him what he wants and what he needs. He will prove it to you.

KEN-L-RATION is a perfectly balanced ration of meat, cereals and refined Norwegian Cod Liver Oil.

Ask for it by name. For sale by grocers, druggists, sport goods stores, veterinarians, feed and grain stores, department stores and pet shops. Write us for FREE sample can.

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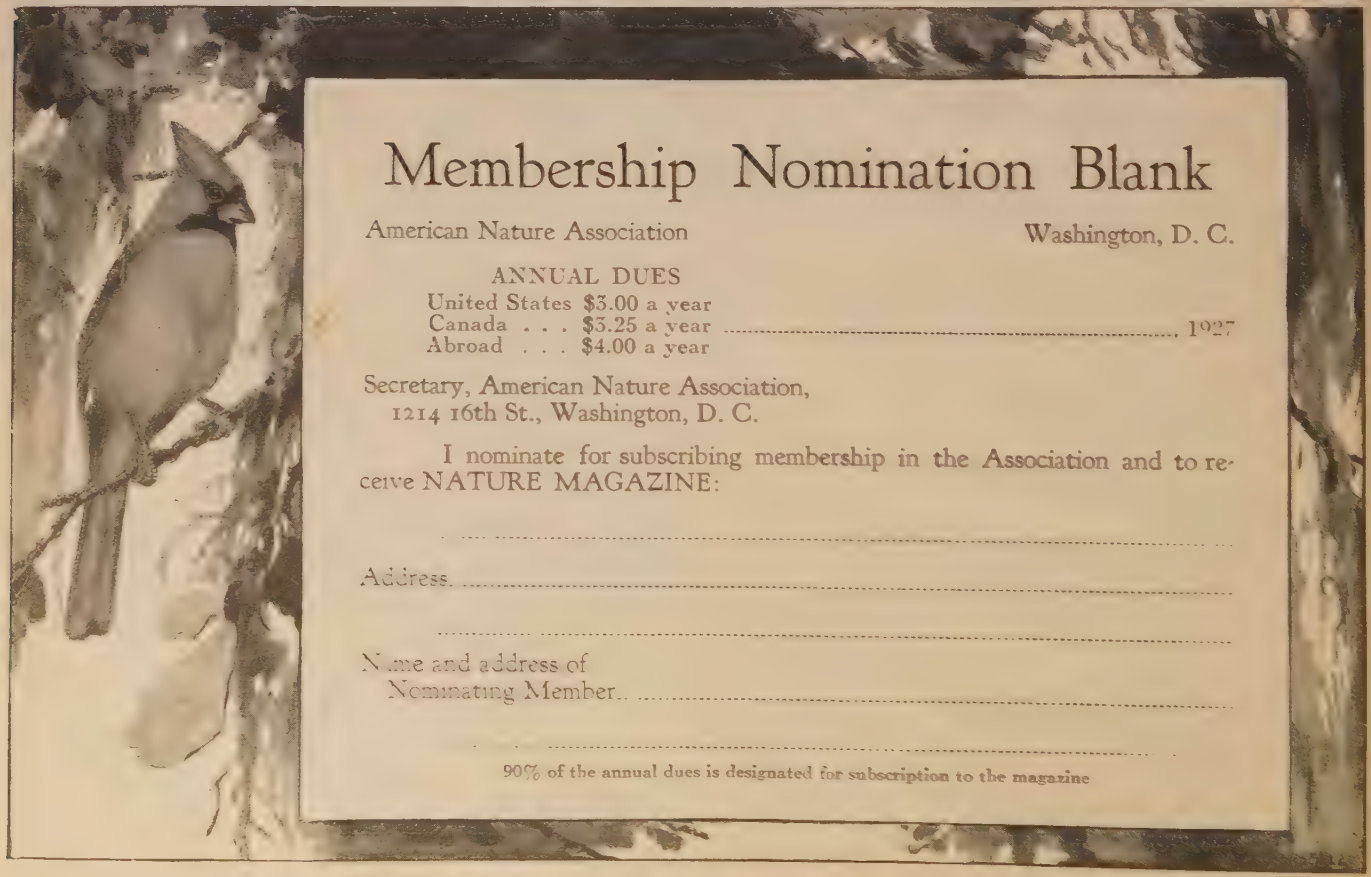

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Index to Nature Magazine

Volume Nine, January-June, 1927

(Gen. indicates a general article; *illus.*, a photograph or drawing; *rev.*, a review*)*

ASTRONOMY

Astronomy Hall, 122
  modern (rev.), 275
Evening sky (gen., illus.), January, 46-47; February, 118-119; March, 181-182; April, 251-252; May, 311-312; June, 382-384.
Meteoric showers, 200.
Moon, eclipse, 380
Orion, 7, 46-47 (gen., illus.).
Virgo (illus.), 312.

BIRDS

Accipiter cooperi (illus.), 32.
  velox (illus.), 32.
Albatross, black-footed (illus.), 75.
Aphriza virgata, nest, 204.
Archibuteo lagopus sancti-johannis (illus.), 32.
Archilochus colubris (illus.), 374.
Arenaria interpres morinella (illus.), 237.
Astur atricapillus (illus.), 32.
Auklet, crested, 217.
  least, 212 (illus.), 217.
  paroquet, 212 (illus.), 217.
Avocet (illus.), 237.
Baillie brushkie, 217.
Bird feet (illus.), 39.
Bird house, 300 (illus.), 334.
  simple, 194.
Bird migration (rev.), 4.
  music (gen.), 48-49, 261.
Birds and animals (rev.), 51.
  and insects, 53.
  history (illus.), 184.
  in city, 332.
  in city parks (rev.), 51.
  in rhyme (rev.), 139.
  nesting time (gen., illus.), 241-244.
  thinking, 51.
Bluebird, 242 (illus.), 243, 244, 373, 376, 374 (illus.).
  frozen, 329-330.
Blue Jay, 52, 62, 307.
Bobolink, 242, 373, 375 (illus.).
  protected, 326.
Bobwhite, 7, 244.
Bubo virginianus, 84.
Bunting, snow, 209.
Buteo lineatus (illus.), 32.
  platypterus (illus.), 32.
  swainsoni (illus.), 32.
Cardinal grosbeak, 71.
Cassowary (gen., illus.), 56.
Charadrius semipalmatus (illus.), 237.
Chickadee, 7, 40, 307.
Choochkies, 217.
Circus hudsonius (illus.), 32.
Condor (pub., rev.), 204.
  California (gen., illus.), 378.
Cormorant, 293.
Cowbird, 243, 373.
Crane, sandhill (illus.), 107.
Crow, 293.
Cuckoo, 243.
  yellow-billed, 155.
Dolichonyx oryzivorus, 375 (illus.).
Dove, 53.
  mourning, 307.
Duck, wood, 280.
Eagle, 209.
  bald, 293.
  white-headed (gen., illus.), 143, 146.
Egret, 280.
Falco peregrinus anatum (illus.), 32.
  sparverius (illus.), 32.
Finch, purple, 307.
  rosy, 78, 211 (illus.), 217.
Flicker, 85, 379 (illus.).
Flycatcher, great-creasted, 280.
  least, 244.
Gannet (gen., illus.), 349-352.
Geothlypis trichas, 374 (illus.).
Goldfinch, 244, 307.
Goonie, 75.
Goose, Canada, 8 (illus.), 9-12, 107-111 (gen., illus.).
  Chinese (gen., illus.), 86.
Grouse, ruffed, 141.
Gull (illus.), 75, 293.
  black-backed, 41.
  glaucous-winged (illus.), 159, 162.
Hawk, broad-winged (illus.), 32.
  Cooper (illus.), 32.
  duck (illus.), 32.
  fish (illus.), 32.
  goshawk (illus.), 32.
  marsh (illus.), 30, 32.
  red-shouldered, 32 (illus.), 141, 209.
  red-tailed (illus.), 32.
  rough-legged (illus.), 32.
  sharp-shinned (illus.), 32.
  sparrow, 32 (illus.), 204, 242.
  Swainson (illus.), 32.
Hawks, plea for (gen., illus.), 30-32.
Heron, black-crowned, 280.
  great blue, 280.
  little blue, 280.
  yellow-crowned, 280.
Heteralocha acutirostris, 78.
Himantopus mexicanus (illus.), 237.
Houstonia, 209.
Huia, New Zealand (gen., illus.), 78.
Hummingbird, Calliope, 204.
  ruby-throated, 204, 243, 373, 374 (illus.), 377.
  rufous, 151.
Ibis, wood (gen., illus.), 279-282.
Icterus galbula, 375 (illus.).
  spurius, 375 (illus.).
Killdeer, 244.
Kinglet, golden-crowned, 7.
Iridaprocne bicolor, 374 (illus.).
Leucosticte, Aleutian, 217.
Limmershin, 217.
Longspur, 209.
  Alaska, 75 (illus.), 78, 214.
Loon, 41.
Magpie, 200.
Mallard, domesticated (gen., illus.), 29.
Meadowlark, 242.
Merganser, 41.
Mockingbird (gen., illus.), 155-158, 193.
Murre (illus.), 212.
  Pallas (illus.), 160, 163, 164.
Nutcracker, 71.
Nuthatch, 40, 242.
  white-breasted, 129.
Nyctea nyctea, 132.
Oriole, Baltimore, 242, 373, 375 (illus.).
  orchard, 242, 280, 375 (illus.), 376.
Osprey, nest (illus.), 31.
Ovenbird, 243.
Owl, great horned (gen., illus.), 83-86.
  food, 85.
  snowy, 122-123, 132, 333.
Oyster-catcher, black, 162.
Pandion haliaetus carolinensis (illus.), 32.
Partridge, 53.
Phalarope, Wilson (illus.), 237.
Phoebe, 242.
  nest (illus.), 243.
Pigeon, 85.
Pirangaerythromelas, 374 (illus.).
Plover, back-bellied (illus.), 237.
  golden (illus.), 236.
  semipalmated (illus.), 237.
  upland, 235, 236 (illus.).
Pooectes gramineus, 375 (illus.).
Ptarmigan, 162.
Puffin, 75.
Quail, 307.
Raven, 209.
Recurvirostra americana (illus.), 237.
Redstart, 243.
Robin, 52, 85, 129, 132, 242.
  nest (illus.), 243.
  nesting (gen., illus.), 105.
Rosy finch, 162.
Rubicola minor (illus.), 236.
Ruffed grouse, 209.
Sandpiper, Aleutian (illus.), 76.
  Bartramian, 235.
  Pribilof (illus.), 213.
  spotted, 243, 244.
Sapsucker, 209.
  yellow-bellied, 85.
Sea-parrot, 75.
Shag, 293.
Shearwater, 75.
Sialia sialis, 374 (illus.).
Snipe, 209, 235.
  Wilson (illus.), 236.
Snow bunting, Pribilof, 214.
Snowflake, 78.
Sparrow, Aleutian song, 162.
  chipping, 195, 196, 373, 376, (illus.) 376.
  English, 190, 228 (gen., illus.).
  Savannah, 78.
  song, 71.
  vesper, 375 (illus.), 376.
  white-throated (illus.), 307.
Spizella passerina, 375 (illus.).
Squatarola squatarola cynosurae (illus.), 237.
Steganopus tricolor (illus.), 237.
Stilt, black-necked (illus.), 237.
Surf bird, nest, 57, 204.
Swallow, barn, 277.
  cliff, 54 (gen., illus.), 277.
  eaves, 54, 277.
  tree, 373, 374 (illus.).
Swift, 333 (flight).
  chimney (gen., illus.), 356.
Tanager, scarlet, 376, 374 (illus.).
Thrasher, brown (illus.), 243.
Titlark, 162.
Titmouse, tufted, 332.
Troglodytes aedon, 374 (illus.).
Turnstone, ruddy (illus.), 237.
Vireo, 307.
  red-eyed, 7.
  warbling, 375, (illus.), 376.
  yellow-throated, 243.
Vireosylva gilva, 375 (illus.).
Vulture, turkey, (gen., illus.), 367-368.
Warbler, Audubon, 277.
  bay-breasted, 277.
  Blackburnian, 277.
  chestnut-sided, 243.
  Macgillivray, 277.
  magnolia, 277.
  pine, 209.
  prothonotary, 280.
  Townsend, 277.
  Wilson's, 277.
  yellow, 127, 242 (nest illus.), 243.
  yellow-throated, 130.
Willet (illus.), 236.
Woodcock (gen., illus.), 235-240.
  eggs (illus.), 238.
  song, 141.
Woodpecker, downy, 7, 40.
  drumming, 141.

hairy, 40, 260.
red-bellied, 280.
red-headed (illus.), 39.
Wren, Alaska, 217.
house (illus.), 241, 374.
Yellowlegs, 235, 236 (illus.).
Yellowthroat, Maryland, 373, 375 (illus.), 376 (illus.).

CONSERVATION

Flower preservation (gen., illus.), 97-100.
Plants, protection, 258.
Plea for animals (rev.), 274.
hawks (gen., illus.), 30-32.
woodcock (gen., illus.), 235-240.

FISHES

Alewife (gen., illus.), 363-366.
Chub, 42.
Fishes in home (rev.), 275.
Goldfish, fantail, 334.
Perch, yellow, 42.
Salmon, 71.
leaping (illus.), 292, 294.
Shark, birth, 128.
Trout, Dolly Varden, 77.

FORESTRY

Brush, burning (illus.), 357.
Clarke-McNary law, 129.
Forest camps, 327.
fire (illus.), 358.
week, 120, 202.
Forestry education, 50.
meeting, 52.
women's clubs, 322.
Lumber waste (gen., illus.), 113-115.
National Forest report (rev.), 189.
Tree, highway planting, 187.
twins (gen., illus.), 16.
watering (gen., illus.), 102.
Wire-killed (illus.), 119.
Trees, Mexican (rev.), 66.
roadside planting (rev.), 68.
Wood, structure (illus.), 178, 179.

INSECTS AND OTHER INVERTEBRATES

Bagworm, campaign, 188.
Balalinus proboscideus, 89.
Bettle, hercules, 27-29 (gen., illus.), 39 (illus.).
snout (gen., illus.), 89.
water, 71.
Butterfly, mourning cloak, 141, 209.
Caterpillar, cecropia, (gen., illus.), 366.
tent, campaign, 188.
woolly bear, 117, 353 (gen., illus.).
Cicada, periodical (gen., illus.), 288-290.
Cricket (illus.), 82.
Damsel fly, 380.
Dragon fly (illus.), 379.
Fly foot (illus.), 80.
midge, 71.
tongue (illus.), 79.
Geometridae, 361.
Gordiidae, 201.
Hair-worm, 201.
Katydid egg-laying, 257, 328-329.
Locust, 17-year (gen., illus.), 288-290.
Mosquito, 38.
Moth, cecropia, 117, 366.
isabella tiger, 117.
Polyphemus (illus.), 117.
promethea, 117.
tiger (gen., illus.), 353.
tussock (gen., illus.), 227-228.
Pentatomidae, 287.
Plant-lice, 287.
Samia cecropia (gen. illus.), 366.
Scale-insects, 287.
Snow fleas, 71, 200.
Spider, orb-weaver (gen., illus.), 371.
Tarantula (gen., illus.), 173-176.
Termites, damage (gen., illus.), 158.
Tree-hopper, 287.
Webworm, fall, campaign, 188.
Weevil, chestnut, 89.
Worm, measuring (illus.), 361.

MAMMALS

Baboon, white, 250.
Bat, flight, 334.
hoary, 63.
migrating, 63.
red, 63.
silver-haired, 63.
Bear (illus.), 74, 75, 76.
brown, 77.
dens (gen., illus.), 372.
slaughter, 55.
Beaver, 7, 42.
Caribou (illus.), 75.
barren ground, 77.
Cat, falling, 194.
feral, 62.
Cattle, long-horned, 260.
Cheetah, 63.
Chipmunk (illus.), 39, 42.
Cottontail, baby (illus.), 234.
Dicrostonyx, 333.
Dog, nursing cat, 192.
postoffice (gen., illus.), 56.
training (gen., illus.), 219-222.
Dolphin (gen., illus.), 52.
Fox, blue (illus.), 213, 215, 216.
Fur seal, 212, 213, 214 (illus.).
Gopher, pocket, 63.
Greyhound, 63.
Hare, varying, 122.
Jack rabbit, white-tailed (gen., illus.), 176.
Kangaroo rat (gen., illus.), 13-16.
Lemming, 122.
white, 333.
Lemmus lemmus, 333.
Leopard, hunting, 63.
Lepus campanius, 176.
Mammal Society meeting, 191.
Mandrill, 250.
Monkey (gen., illus.), 250.
Moose, Kenai, 295.
Mouse, jumping, 266.
red-backed, 42.
white-footed, 7.
Muskrat, 7, 42, 171-172 (gen., illus.).
Mustela cicognanii, 195.
Opossum, murine (gen., illus.), 103-105.
Plagiodontia (illus.), 34.
Porcupine (illus.), 291, 370.
Prairie-dog, 334.
Rabbit, 7, 85.
cottontail, 265.
raising (rev.), 274.
white, 122.
Rat, kangaroo, 334.
Norway, 85.
trade, 260.
Seal, hair (illus.), 215.
Sealion, 54, 160, 161 (gen., illus.), 162 (illus.).
Sheep, mountain (illus.), 293, 294.
Skunk, as pet (illus.), 199.
Squirrel, 7, 245-246 (gen., illus.).
flying (gen., illus.), 206.
ground (illus.), 233, 334.
Weasel, climbing tree, 195.
short-tailed, 85.
Wolf, 71.
Woodchuck, 71.

NATURE STUDY

Alpine club, 250.
Association, Advancement Science, 43.
Nature and church, 52.
association activities, 36.
camp (gen., illus.), 301-302.
cartoons, 36 (illus.), 106 (gen., illus.).
contest, 354, 355.
club, Franklin County, 196.
club, Greencastle, 196.
column, 198, 320.
correspondence, 261.
education, 112, 183, 254, 317.
poems (rev.), 68.
plays (rev.), 134, 138.
puzzle, 59, 139, 316 (illus.), 384 (illus.).
Nature study, 5, 43, 183, 195, 312, 390, 391.
January, 39-40; February, 116-117; March, 184-186, 287; April, 233-234; May, 307-308; June, 379-387.
club, 196, 262, 265.
leaflet, 5.
meeting, 113.
Oklahoma, 262.
Scenery, 43.
summer school, 260.
trails, 258.
Near Nature's heart (rev.), 51.
Nursery tales (gen., illus.), 318, 390.

PARKS AND REFUGES

Bird Haven, 258.
Commandments of [illegible], 58.
Museum, St. Johnsbury, 57.
National Parks, Creed, 191.
Park, California, 258.
Colorado, 258.
Great Cahokia Mound, 330.
Yellowstone, 192.
Parks, State, meeting, 322.

PHYSICAL PHENOMENA

Book of clouds (rev.), 207.
Book of sunsets (rev.), 206.
Cumberland Falls (gen., illus.), 152.
Earthquakes (gen., illus.), 283-287.
Fogs and clouds (rev.), 66.
Iceberg (illus.), 292.
Ice-storm (gen., illus.), 147-151.
Lightning (gen., illus.), 309.
Physics, concepts (rev.), 274.
Rock, balanced, 198.
Sandstone pillars (gen., illus.), 95-96.
Soil erosion, 52 (rev.), 385-388 (gen., illus.).
Wind and weather (gen., illus), 17-20.

REPTILES AND AMPHIBIANS

Boa, Santo Domingo, 200.
Bullfrog, 42.
Chameleon (gen., illus.), 362.
Chelone obliqua (illus.), 33.
Chorus-lover, 141.
Dinosaur (gen., illus.), 297-300.
duck-billed (gen., illus.), 35.
Frog, bull, 232, 264.
goliath, 63.
spring (illus.), 379.
wood, 141.
Glass snake, 55.
Horntoad, breeding, 63.
food, 63.
Newt (illus.), 184.
Snake and mouse (poem), 61.
Snakes, Iowa (rev.), 134.
Spring peeper, 7, 71, 141.
Terrapin, diamond back (illus.), 87.
Toad, 7.
moulting, 200.
Tortoise, desert (gen., illus.), 252, 265.
Galapagos (illus.), 87.
Trachodon annectens (illus.), 35.
Tropidophis maculata haetiana, 200.
Turtle, green, 88.
harp, 88.
hawk's-bill, 88.
leatherback (illus.), 88.
plea for (gen., illus.), 87-89.

PLANTS, GENERAL

Adder tongue, yellow, 99 (illus.), 100.
Agapanthus, 223.
blue, 226.
Aloes, 224, 226.
Amaryllis, 223.
belladonna, 226.
Amphipleura pellucida, 81.
Anemone (illus.), 293.
Anemone quinquefolia (illus.), 99.
Aponogeton distachyon, 226.
Aptosimum depressum, 225.
Aquilegia (illus.), 169.
Arbutus, trailing, 232, 327.
Arctotis, 226.
Arisaema triphyllum, 304 (illus.), 306.
Aristea capitata, 226.

Arum, white (illus.), 225.
Aster, New England (illus.), 308.
Babianas, 226.
Bell-heather, pink, 226.
Bird-on-the-wing (illus.), 305.
Blood-flowers, 226.
Bluebell (illus.), 224.
Riverdale (illus.), 225.
Virginia, 305 (illus.), 306.
Bluet, 209.
Blushing-bride (illus.), 224.
Brunsvigia gigantea, 226.
Buphane ciliaris, 226.
Calodendron capense, 224.
Caltha palustris, 304 (illus.), 306.
Candelabra, king, 226.
Canterbury bell (illus.), 168.
Centaurea (illus.), 168.
Cereus hexagonus (illus.), 126.
Chestnut, Cape, 224.
Claytonia virginica (illus.), 98.
Club-moss, 377.
Columbine (illus.), 169.
Coreopsis (illus.), 169.
Cotyledons, 224.
Cowslip, 209, 306.
Crassula, 224.
Crinum, 223.
Currant, western (gen., illus.), 151.
Dahlia, 170.
Daisy, Barberton, 223.
Diascias, 226.
Dicentra cucullaria, 266.
Dimorphotheca, 226.
Disa ferruginea, 225.
graminifolia, 225.
longicornis, 226.
uniflora 225 (illus.), 226.
Dock, 39.
Dog-tooth violet, 97.
Driedoorn, 225.
Dutchman's breeches, 184, 266.
Erica longifolia (illus.), 224.
Erythrina caffra, 224.
Erythronium americanum, 99 (illus.), 100.
Feijoa, 193.
Fern, maidenhair, 377.
Flower preservation (gen., illus.), 303-306.
South Africa (gen., illus.), 223-226.
Gazania, 223, 226.
Geranium maculatum (illus.), 98.
Geranium, wild (illus.), 98.
Gladiolus bolusii (illus.), 225.
Gousbloem, 226.
Haemanthus, 226.
Heath, long-leaved (illus.), 224.
Heliophilas, 226.
Hellebore, American, 384.
Hen and chickens (gen., illus.), 94.
Hepatica americana (illus.), 305.
triloba, 377.
Honeysuckle, kaffir, 224.
Hypoxis stellata (illus.), 226.
Irises, 170.
Ironweed, 7.
Ixia, 223.
Jack-in-the-pulpit, 97, 304 (illus.), 306.
Joe-pye weed, 7.
Kaffir boom, 224.
Knifofia aloides, 226.
Lachenaleas, 226.
Lily, Lent, 226.
Marigold, marsh, 209, 304 (illus.), 306.
Mertensia virginica, 305 (illus.), 306.
Mesembryanthemum, 224.
Mullein, 39.
Nemesia, 223, 226.
Nerine, mountain nymph, 226.
Nymphaea stellata, 226.
Oxalis, 224, 225.
Pelargonium, 223, 224.
Pink, Deanthus (illus.), 169.
Plantain, 39.
Podalyria calyptrata, 226.
Podranea ricasaliana, 224.
Polygala pauciflora (illus.), 305.
Pondweed, 226.
Poppy, Iceland (illus.), 168.
Primrose (illus.), 168.
Protea, 225.
mellifera (illus.), 223, 226.
Rattlesnake plaintain, 377.
Rhigosum obavatum, 225.
Sebaeas, 226.
Skunk cabbage, 71.
Spring-beauty, 97, 98 (illus.).
Squirrel corn, 184.
Stapelias, 225.
Star, peacock (illus.), 226.
Sugar bush (illus.), 223.
Tecomaria capense, 224.
Thalictrum (illus.), 169.
Tritonia, 223.
Tulip (illus.), 45.
Tulps, 224.
Turtle-head, pink (illus.), 33, 189.
Ursinia, 226.
Veratrum viride (gen., illus.), 384.
Viola pedata, 305 (illus.), 306.
Violet, birdfoot, 304 (illus.), 306.
blue (illus.), 306.
karroo, 225.
Wahlenbergia, 226.
Watsonia rosa, 226.
tabularis, 226.
Wild flower contest, 325.
Zantedeschia africana (illus.), 225.

TREES AND SHRUBS

Achras sapota, 60.
Azalea, wild, 232.
Bay, sweet, 55, 334.
Bay-tree, 334.
Birch, sap, 141.
Bittersweet, 232.
Box-elder, sap, 141.
Boxwood (illus.), 231.
Dolly Madison, 230.
Thomas Jefferson, 230.
Cactus, giant (illus.), 360.
Cercis canadensis, 99 (illus.), 100.
Clematis, 232.
Cornus canadensis (illus.), 98.
Creeper, St. John's, 224
Virginia, 232.
Dogwood, flowering (gen., illus.), 310.
Dwarf cornel (illus.), 98.
Fig-vine, strangler (illus.), 119.
Fir, Douglas, 327.
Grape, wild, 232.
Holly, 232.
Ivy, 232.
Laurel, 55.
mountain, 232.
Laurus nobilis, 55, 334.
Magnolia, swamp (illus.), 100.
Mangrove (illus.), 23.
Maple, sap, 141.
swamp, 209.
Mistletoe, 132.
Myrica cerifera, 334.
Neoabbottia (illus.), 34.
Oak, live (gen., illus.), 47.
Palm, royal (illus.), 23.
Pepper tree, 57.
Pinus douglasii, 327.
Taxifolia, 327.
Poison ivy, remedy, 62, 193.
Pseudotsuga taxifolia, 327.
Pussy willow, 71, 141.
Quisqualis indica, 53.
Rangoon creeper, 53.
Red-bud, 99 (illus.), 100.
Ribes glutinosum (gen., illus.), 151.
Sapodilla, 60.
Schinus molle, 57.
Sequoia (gen., illus.), 331-332.
Tamarack, 277.
Tree, chewing gum, 60.
Tree planting (gen., illus.), 247-250.
Trees and shrubs (gen., illus.), 247-250.
Trees, how serve (rev.), 139.
life blood (gen., illus.), 177-180.
Tulip (illus.), 45.
Virginia creeper, 63.
Willow, bloom, 326.
Wisteria, 232.
Yucca (gen., illus.), 21, 22.

MISCELLANEOUS

Alaska, camera hunting (gen., illus.), 73-78, 159-164, 211-217, 291-296.
Animal tales, Rockies (rev.), 207.
Aquarist, amateur (rev.), 123.
Auk (rev.), 204.
Backdoor neighbors (rev.), 206.
Biography, Baird, S. F. (illus.), 101-102.
Burroughs (illus.), 369-370.
Darwin (illus.), 319-320.
Nuttall (illus.), 37-38.
Botanical expedition, 53.
Botanist, American (rev.), 204.
Cathedral, Washington (gen., illus.), 230-232.
Dall, W. H., death, 322.
Erosian (gen., illus.), 385-388.
Everglades, Cuba (gen., illus.), 23-26.
Florida flowers (rev.), 2.
Garden books (rev.), 275.
club, 43.
flower enemies (rev.), 2.
hints, 44-45, 90, 166, 218, 313, 389.
nature (gen., illus.), 167.
Hygrometer (illus.), 358.
Kangaroo-land (rev.), 274.
Metric advance (rev.), 51.
Microscope (gen., illus.), 79-82.
Museum graphic (rev.), 204.
Naturalist's pilgrimage (rev.), 206.
Northern plants (rev.), 51.
Old stag (rev.), 275.
Poetry contest, 326.
Science work book (rev.), 207.
Seeds of friendship (gen., illus.), 314-316.
Shiny wings (rev.), 66.
Taxidermy (gen., illus.), 91-94.
Tiger trails (rev.), 68.
Vanadium crystals (illus.), 80.
Weatherwise (rev.), 207.
Westward (ship, illus.), 74.
Zoological Society, Scranton, 324.

LIST OF AUTHORS

Allen, R. M., 79.
Baerg, W. J., 173.
Baker, Mary F., 193.
Baldwin, E. F., 314.
Bell, H. S., 83.
Bennett, H. H., 23, 385.
Blauvelt, H., 195.
Bolus, Lulu, 223.
Brooks, A. B., 105.
Bryant, C. H., 54.
Campbell, J. S., 252.
Champlain, A. B., 227, 288, 353, 371.
Clark, Dorothea, 301.
Cochran, Doris M., 378.
Cook, H. J., 176.
Dall, W. H., 101.
Dickey, S. S., 94, 384.
Douglass, E., 95.
East, B., 143.
Finley, W. L., 73, 159, 211, 291, 369.
Force, Edith R., 262.
Gill, T., 177.
Gilmore, C. W., 35.
Horsfall, Carra E., 373.
Howes, P. G., 27, 241.
Hoyem, O., 230.
Hutaf, A. W., 26.
Hutchinson, W., 102, 309, 331.
Hyer, E. A., 91.
Ingraham, Ruth, 328.
Keil, Ernst, 296.
Kirk, H. B., 288.
Lampman, B. H., 9, 107.
Lewis, Isabel M., 46, 118, 181, 251, 311, 382.
Linkletter, J., 29.
Mason, Ethel, 33, 54, 86, 372.
McAtee,, W. L., 228.
McGill-Nutt, J. C., 78.
Mellen, I. M., 87.
Mitsch, G. E., 42.
Moore, Florence, 139.
Pack, A. N., 167, 247.
Palmer, E. L., 39, 43, 112, 116, 184, 233, 307, 379, 391.
Patch, Edith M., 363.

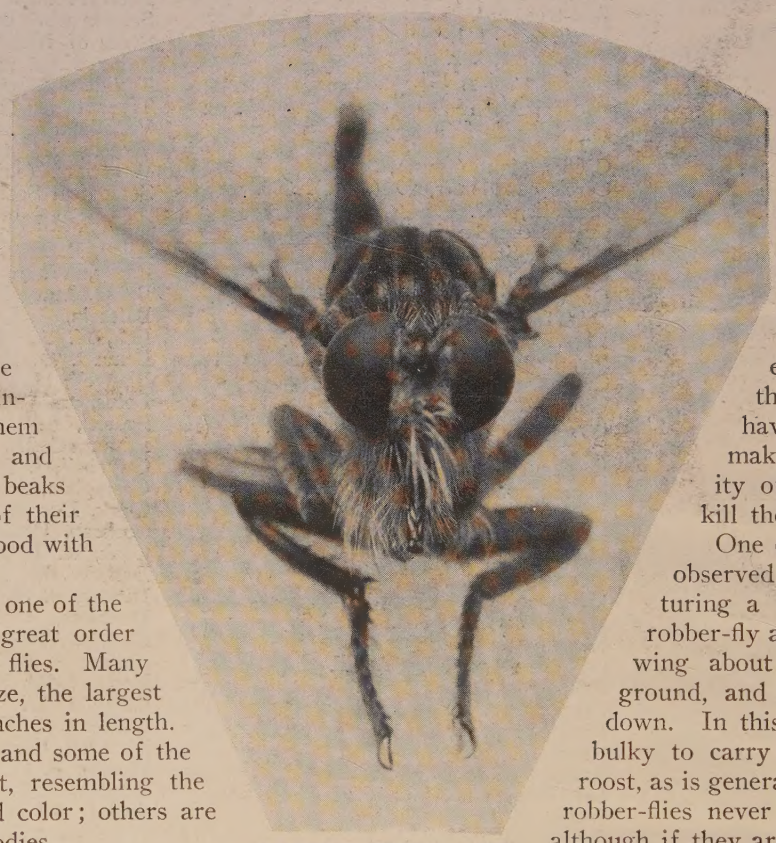
Pease, E. H., 370.
Peattie, D. C., 37, 319, 349.
Peattie, Louise R., 297.
Peeples, Elizabeth K., 165, 229, 390.
Preble, E. A., 30, 56, 122, 141, 209, 235, 277.
Putnam, Bessie L., 89.
Ricker, P. L., 97, 303.
Rine, Josephine Z., 219.
Sass, H. R., 155, 279.
Scoville, S., 153.
Shanafelt, Marjorie, 103, 171, 245.
Shay, A., 21.
Sheldon, Carolyn, 41.
Smith, G. W., 362.
Smitherman, I. T., 47.
Squire, Lorene, 13.
Talman, C. F., 17, 147, 283, 357.
Twining, Frances S., 151.
Wilson, O., 113.
Winkjer, J. G., 356.
Yocom, F. L., 367.
Zerbee, Frances B., 377.
Ziegler, F., 196.

Robber Flies—Notorious Criminals

By A. B. Champlain

LURKING in the sunlit glades of woods and along the mountain trails and country roads, the robber-flies carry on their devastations; or in the open fields where the wild flowers make their appeal to the bees and butterflies, they chase and kill. They are very active creatures and live at the expense of other insects. They grasp them with their strong legs and claws, then diving their beaks firmly into the bodies of their victims, they suck the blood with great voracity.

Robber-flies belong to one of the largest families of the great order Diptera or two-winged flies. Many of them are of large size, the largest measuring nearly two inches in length. They are usually hairy, and some of the species are quite robust, resembling the bumblebees in form and color; others are elongate with slender bodies.



PHOTOGRAPH CORNELIA CLARKE

ROBBER FLY AWING

Head-on view of this predacious and voracious member of the fly family.

Viewed from the front, the robber's head is broad, the compound eyes are prominent, and the remainder of the face is hairy and bearded. The proboscis or beak is stout and strong, and is formed for piercing and sucking. Strong in flight, the two wings are long and narrow, while the legs, which are spiny and furnished with stout claws on their toes, are used in grasping their plunder as well as a support for their body when at rest.

These predatory insects rest on the ground, or upon the foliage of plants growing in open sunny spots. Here they lie in wait for their prey, and when a victim in the shape of some other insect appears, they take to the air with a loud, buzzing sound, catching it on the wing. The unlucky insect, once seized in the powerful grasp of a robber-fly, is powerless to escape. They will attack most any insect, and are even bloodthirsty enough to catch and eat their own kind. Often they have become a nuisance in making their lair in the vicinity of an apiary, where they kill the honey bees.

One of the larger species was observed during the summer capturing a "locust" or cicada. The robber-fly attacked the cicada on the wing about twenty feet from the ground, and the pair came whirling down. In this case the booty was too bulky to carry off to some convenient roost, as is generally the case. Fortunately robber-flies never attack man or animals, although if they are carelessly grasped they will sink their lancets into the flesh. The larvæ or "maggots" that hatch from the eggs laid by these flies are also carnivorous. Some of them live in the ground, where they hunt for food among the decaying vegetation; others make their home in rotting logs or beneath loose bark of dying trees, where they hunt and feed upon other soft-bodied insects. If we follow the fortunes of one of these larvæ or "maggots," we will find that after consuming sufficient food and overwintering, it will go through the usual transformation, emerging finally from the pupal case a perfect robber-fly,—and real robber.

THIRTEEN MEMORIAL TREES MARK THE SPOT WHERE WASHINGTON CROSSED THE DELAWARE

To mark the opening of tree-planting week thirteen American Elms were placed by the American Tree Association near the famous McKonkey Ferry House at the point where Washington crossed the Delaware. The trees, one for each of the original colonies, are the gift of Charles Lathrop Pack. Girl and Boy Scouts of Trenton, N. J., Mrs. John Scudder and Mrs. Paul L. Cort of the Daughters of the American Revolution sponsored the trees. Miss Mary L. Hellings, a member of the American Tree Association, had charge of the arrangements.

This Colonial Grove with the New Jersey tree in the center will mark the beginning of a beautiful Road of Remembrance through the State Park and on toward Trenton where events of great historic interest occurred during the Revolutionary War. A marker approved by the State Commission is to be placed in the grove.

Early reports to the American Tree Association which registers all tree planters on its national honor roll show there has been a record tree-planting throughout the country. Seventy-five students of the Canton, N.C., High School took part in the planting of 750 White Pine trees and 1,500 Norway Spruce. This planting of forest trees is an annual event by the Canton, N. C.,High School students.

The program of the Washington De Molay organization of Masons to plant a tree each year in the state for each member of the order, was approved at the meeting of the grand council in Louisville, Ky. Following Washington's lead, Pennsylvania and Colorado De Molay organizations have taken up the "plant a tree" idea and other states are asking for the plan. The 160,000 members of the order are invited to register their trees and join the tree-planting army.

Members of the Diana, Fla., Woman's Club have planted fifty trees on the club grounds and, through Mrs. E. L. Huff, registered them on the association's honor roll.

At Medford, Ore., the Roosevelt School has formed a tree association and through Sara Van Meter the registrations are coming in.

From Dayton, O., comes a report by Sylvia Tyrrell that 300 Girl Scouts have planted 2,000 evergreen trees on their camp site.

Beginning of a movement to plant the denuded hillsides about Johnstown, Pa., was made in the Arbor Day exercises sponsored by the pupils of the Joseph Johns Junior High School, details for which are being furthered by Principal J. D. Ripple with the cooperation of H. R. Heathman, forester for the Bethlehem Steel Company; Daniel S. Stewart, representing the Shade Tree Commission, and T. I. Shirey, forester of the Gallitzin District. Plans call for each of the 1,000 children to plant at least one tree on the barren tract. To stimulate interest among the boys and girls they are being instructed in the elementary principles of forestry, using the "Forestry Primer" of the American Tree Association as the basis of their lessons.

Brooklawn School in Philadelphia has planted 35 trees to beautify the grounds. The work was directed by B. E. Daniels, Archie Faulkner and William Scott.

A movement to set out trees along state highways in the vicinity of Anderson, Ind., is under way, the project being pushed by Mrs. H. P. Cook, who is consulting John D. Williams, director of the Indiana Highway Commission.

The girls of Nuan-Chon-Wape-Au-Chen-Wape (Autumn leaves) group of Camp Fire Girls of Troy, N. Y., are planting a camp fire forest of 2,000 trees under the direction of Mrs. Lillian Cottrell DeLong, and two other groups in the Troy Council are setting Christmas trees.

Around the sun dial placed in the yard before the old McKonkey Ferry House at Washington Crossing by the Daughters of the American Revolution Girl and Boy Scouts dedicate thirteen American Elms in a Colonial Grove. In the photo are Alfred Skelton, Jessie Black, Elizabeth Wylie, Cap't. Margaret Paterson, Mary, Abel, Stephen Szolomayer.

The Kootima Campfire Girls, the tree committee of which is Marion Keith, Marla Russell and Mrs. W. B. Bannerman, planted a red oak at Brockton, Mass.

A maple and a pine, were planted in the South Broad Street Park, Norwich, N. Y., by members of the Fylfot Crewe under the direction of Mr. and Mrs. Edward E. Davis. Miss Olive Babcock was the leader, 25 members of the organization being present. The Crewe song was sung. Miss Josephine Bonney, Lilas Daley and Mildred Male were others on the program.

Tree-planting was the climax to a one-month "More attractive Wilmette" campaign, when the village's nine Boy Scout troops conducted a tree-planting ceremony at the public library. Maj. George Harbaugh, scout commissioner presided and among the speakers were Earl Orner, village president, and R. J. Harper, president of the library board.

Mohawk Chapter, Daughters of the American Revolution, at Albany began planting seven acres of trees. Miss Pauline H. Wilson is regent of the chapter and Mrs. Preston H. Porcheron, was chairman of the committee. Dr. Fannie Bailey, veteran Albany clubwoman, planted the first tree. James R. Simons of the New York State Forestry Association had charge.

The first annual tree planting under the auspices of the Altrusa Club of Houston was started on Main Street Boulevard, according to the report by Lela M. Black.

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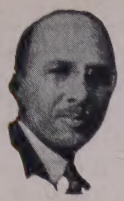

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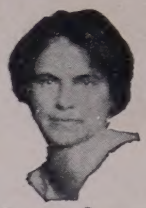

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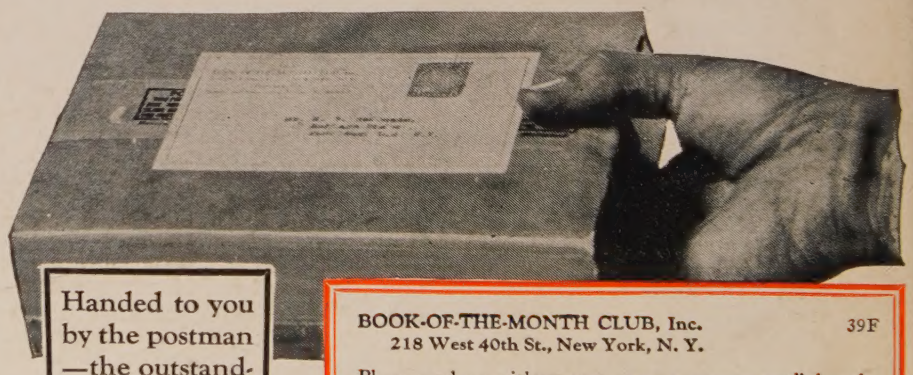

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